PQWeb 3.0
User Manual

November 2002

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1. Overview

PQWeb is a viewing and reporting program for power quality data stored in a PQView database. The functionality provided to an end user includes:

- Event listing of transients and RMS variations
- Waveform plotting and zooming
- Summary report of RMS variations with magnitude-duration plots
- Trend plots and histograms of steady-state samples
- Monitor availability report
- Download files in Power Quality Data Interchange Format (PQDIF)

Users need an Internet browser compliant with JavaScript 1.3, and with Portable Network Graphics (PNG) format. Supported versions include Internet Explorer 4.72 or later, and Netscape Navigator 4.72 or later.

PQWeb opens databases in read-only mode and never alters any database. Its use is limited to retrieving data for viewing and analysis.

1.1. What's New

Improvements and changes in PQWeb version 3.0:

- The Event Summary Table report has been expanded, offering a variety of 'shortcuts' for retrieving lists without editing the preferences. All of the shortcuts return non-aggregated lists of events, resulting in faster retrieval of the data.
- Waveform plots are now included in RMS Variation event reports (when available).
- Trend reports can now be generated for any channel in the selected database, including channels new to PQView 3.0.
- The default voltage normalization option has been changed from 120V base to actual volts.
- The site name list box on the main Reports page has been lengthened; site names from PQView 3.0 databases can be up to 64 characters long.
- A variety of 'shortcut' Steady State Trend reports are now included, making it possible to generate common trend plots without selecting channels or editing preferences.
- A welcome message is now displayed on the Home page, displaying the ID of the logged-in user.
- The default ('Home') page has been simplified. Information about browser requirements was removed.
- The Frames option was eliminated to simplify navigation between pages.
- A navigation menu has been added to the top of each page, with links to other relevant pages such as Preferences pages.

- A Help link is available on each page at the top navigation menu. Help pages have been improved to provide more information to first-time users.
- An option has been added to normalize event voltage to percent in event reports.
- NT Authentication can now handle <Domain>\<User Name> format.
- The PQWeb.ini file has been enhanced to allow PQWeb administrators to specify default preferences and graph color pallettes.
- The default database specified in the Basic section of the PQWeb.ini file is now selected automatically in the Home page listbox of available databases (if it is included in the list of available databases for the current user).
- A range calculation has been added to the Steady-State Statistical Summary.
- A "PQWeb®" trademark has been added to the bottom right corner of every graph.
- An option has been added to display the event number at the bottom left corner of Event Report graphs.
- An option has been added to the Trend preferences for automatically setting the y-axis minimum to zero.
- When plotting Envelope (min / max / avg) trends, the Average curve is plotted with a thicker line than the minimum and maximum curves.
- Steady-state trend plots which aggregate data from multiple sites can now be created. For Current and Power channels, the data from the multiple sites is summed. For other channels such as Voltage, the data is averaged.
- The Trend Preferences page now includes options for performing time aggregation of steady-state data, in order to smooth the curves and enhance longer-term trends in the data plots.
- The Trend Preferences page now includes an option to allow plotting of minimum, average, or maximum curves individually.

Improvements and changes in PQWeb version 2.2:

- **Faster.** Because PQWeb 3.0 uses OLEDB to access Microsoft Access and Microsoft SQL Server databases, it runs queries significantly faster than PQWeb 2.0, which used DAO.
- **Multiple Phase Plots.** With version 2.2, PQWeb can now display more than one phase on each plot. This allows you to create waveform, rms voltage variation, and trend graphs that show single or three-phases. You can even combine voltage and current on one chart.
- **Online Graph Zooming.** You can now rescale the axes for all waveform and trend plots. Also, to take full advantage of large computer displays, or to view reports on small displays, you can customize the size of each image by changing a preference. You can even add a caption to each graph.

- **Steady-State Report.** We have replaced the Steady-State Analysis Wizard of PQWeb 2.0 with a Steady-State report that is both easier to use and more flexible. The new report creates time trends, histograms, and statistical summary tables of any voltage, current, power, energy, or demand quantity housed in the PQView database. The report can be quickly configured using a preference page, and configurations are saved as cookies with your computer's web browser. This means that once you are satisfied with your steady-state report display settings, they will be immediately available the next time that you run the report.
- **More Steady-State Data.** PQWeb 2.0 could only process up to 10000 data points at a time. With PQWeb 3.0, steady-state trends could include hundreds of thousands of data points, meaning that you can make trend charts that span years.
- **Monitor Availability Report.** A new monitor availability report has been added so that you can determine when your power quality monitors were online without needing to run PQView's Power Quality Data Analyzer.
- **ITIC, SEMI, and IEEE 1346 Curves.** In addition to offering the CBEMA voltage magnitude versus event duration scatter plot for analyzing rms voltage variations, PQWeb 3.0 includes the Information Technology Industry Council (ITIC) and SEMI Std. 2844A curves for its rms voltage variation report. Three equipment compatibility curves from IEEE Std. 1346-1998 can also be selected.
- **PQDIF.** Waveforms, rms voltage variations, trends, and histograms can be downloaded as IEEE P1159.3 PQDIF files that can be analyzed or saved to your local computer. For example, TOP, The Output Processor© is a free viewer that can read PQDIF files. Another popular PQDIF viewer is DRAN-VIEW.
- **Online Help.** PQWeb 3.0 offers online help with every web page.
- **Database Flexibility.** PQWeb 3.0 can query any PQView database stored in Microsoft Access 95, Access 97 or Access 2000 format or in Microsoft SQL Server 6.5 or SQL Server 7.0 format.
- **SQL Server Queries Run Faster.** PQWeb 3.0 connects directly to SQL Server, where PQWeb 2.0 used a slower indirect connection. This means that queries to SQL Server databases will run significantly faster. Many of the queries in PQWeb have also been redesigned to take advantage of client/server database processing.
- **User Customizable.** The preferences for each user's browser are saved locally using cookies.
- **Administrator Customizable.** As PQWeb 3.0 employs a combination of Active Server Page files and ActiveX server objects, it can be customized and extended by a developer familiar with web programming.
- **PQWeb Administration Utility.** A new PQWeb Administration utility program is installed on the server to allow fast configuration of multiple PQView databases and user access groups.

1.2. Other Changes

The procedure for implementing multiple PQWeb 2.0 sites on a server, given in PQView Tech Note #99-1, is not applicable to PQWeb 2.2 or 3.0. The "Web Site Alias" information described in PQView Tech Note #99-2 still applies.

In this version, the Web pages for multiple PQWeb sites can all reside in the same physical directory. Internet Information Server can be used to create multiple Web applications (URLs) over the same physical directory, but with different user authentication setups. This version does not use separate configuration files for each site, but based on the user authentication, more than one database can be selected from the PQWeb entry page.

2. User Guide to Queries and Reports

This section describes how to use PQWeb from a client browser. A sample database is available at http://www.powermonitoring.com/pqwebdemo. Enter this URL into your browser, or use the URL for your company's PQWeb site.

2.1. Login to PQWeb

You may be asked for a password as illustrated in Figure 1. Some PQWeb sites, such as the demo URL listed above, allow anonymous access with no password. After you supply the password if required, and PQWeb verifies that your browser accepts cookies, the home page appears as in Figure 2.

You may need to supply a domain along with your user name, in the format “domain\username.”

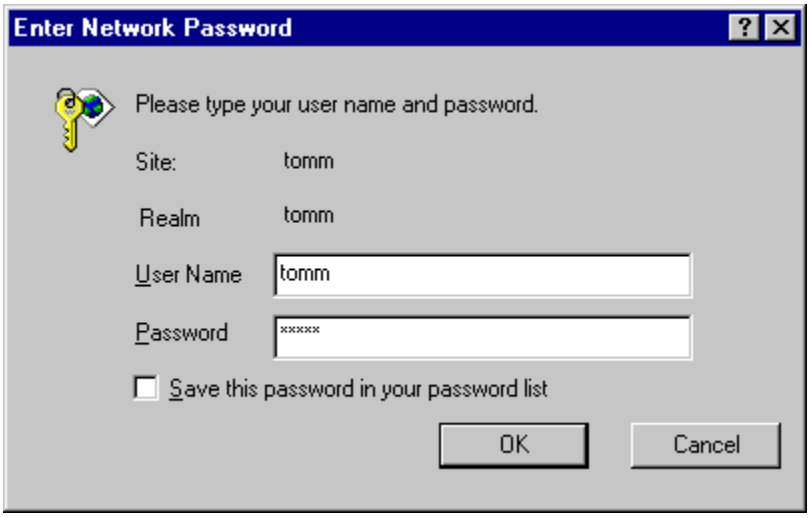

Figure 1 - Enter a password to access the PQView database.

ELECTROTEK CONCEPTS
EPRI
PQWeb® 3.0
PQWeb® is a browser-based tool for viewing power quality data from PQView® databases.
Welcome, FELIX\Administrator. Select a database:
Sample21
Continue
You may download files in the Power Quality Data Interchange Format (PQDIF) for additional offline plotting and post-processing. A PQDIF viewer is available as a free download from www.pqsoft.com/top. Version 5.00.01 or later is required.
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Figure 2 - PQWeb home page.

If the site contains more than one PQView database, you should select one from the combo box in the center of the entry page, shown in Figure 2. If this combo box does not appear, the site may only have one database to choose from, or your password may allow access to only one database. Secured PQWeb sites may limit user access to databases, measurement sites, and PQWeb functionality.

After choosing a database, click the **Continue** button to go on to the Reports page.

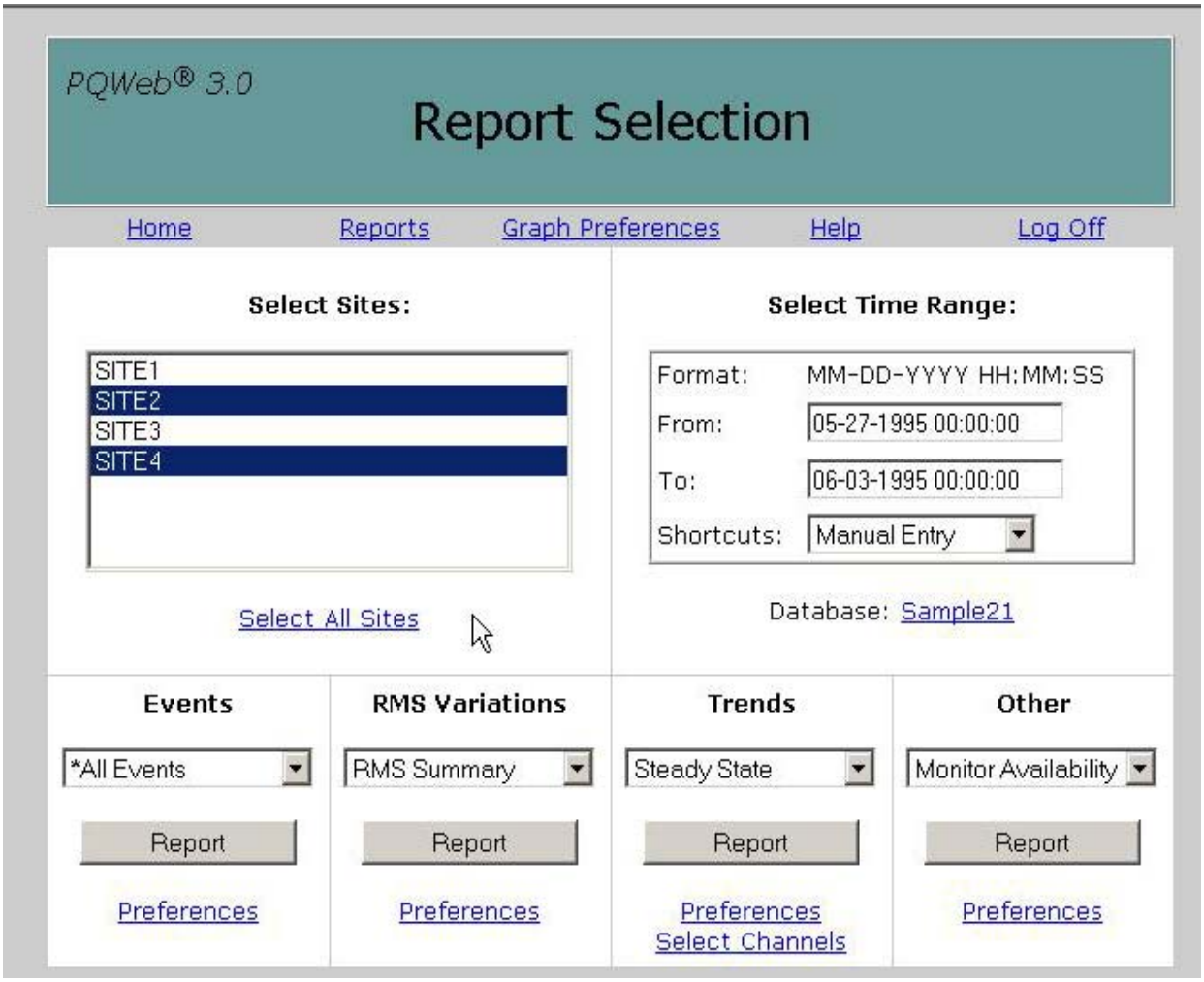


Figure 3 - PQWeb Reports page.

2.2. Reports Page

The Reports page appears as shown in Figure 3. At the top of page there is a listbox of measurement sites to select from, and two edit fields to enter a date/time range for your reports.

At the bottom of the page, there are four categories of reports. Each category has a listbox containing all available report types for that category. Depending upon security policy and user authentication at the site, some of the categories or reports may not appear on the page.

To create a report, select at least one Site from the list of sites. You can use **ctrl-click** and **shift-click** to select multiple sites. Click the link below the list of sites to select all sites in the database.

Next, select the time range for the report. You can use the **Shortcuts** combo box in Figure 5 to quickly enter some useful date ranges, including the full range of data in the database.

Finally, select a report from one of the four listboxes at the bottom of the screen, then click the Report button under that listbox.. The database will be queried for data matching your selected site(s) and date/time range, and a report will be generated.

Please be patient while your query executes; there may be an extensive amount of data needed to generate the graphs and tables in the report.

When you return to the Reports page after creating and viewing a report, the sites and date range you have specified will remain until you change them. This feature allows you to generate multiple reports using the same site list and date range, without having to reselect the sites and range.

2.2.1. Dates and Times

All dates and times are local time (accounting for Daylight Savings Time) on a site-by-site basis. Dates must be entered in the format indicated, which is set at the Web server. The format options are:

- Month-Day-Year Hours:Minutes:Seconds.
- Day-Month-Year Hours:Minutes:Seconds.
- Year-Month-Day Hours:Minutes:Seconds.

The time is optional, and may include fractional seconds. If the time is omitted, 0:00:00 is assumed. Hours range from 0 to 23 and minutes range from 0 to 59. Years may be entered in 2-digit or 4-digit format. Months may be entered as a number from 1 to 12, as a full name, or as a three-letter abbreviation. The From date/time must be less than the To date/time.

2.2.2. Sites in Different Time Zones

If the query includes sites that are in different time zones, the events are ordered by Universal Coordinated Time (UTC), but are still displayed in local site time. Therefore, simultaneous events at sites in different time zones will appear consecutively in the event list, but will display different local event times.

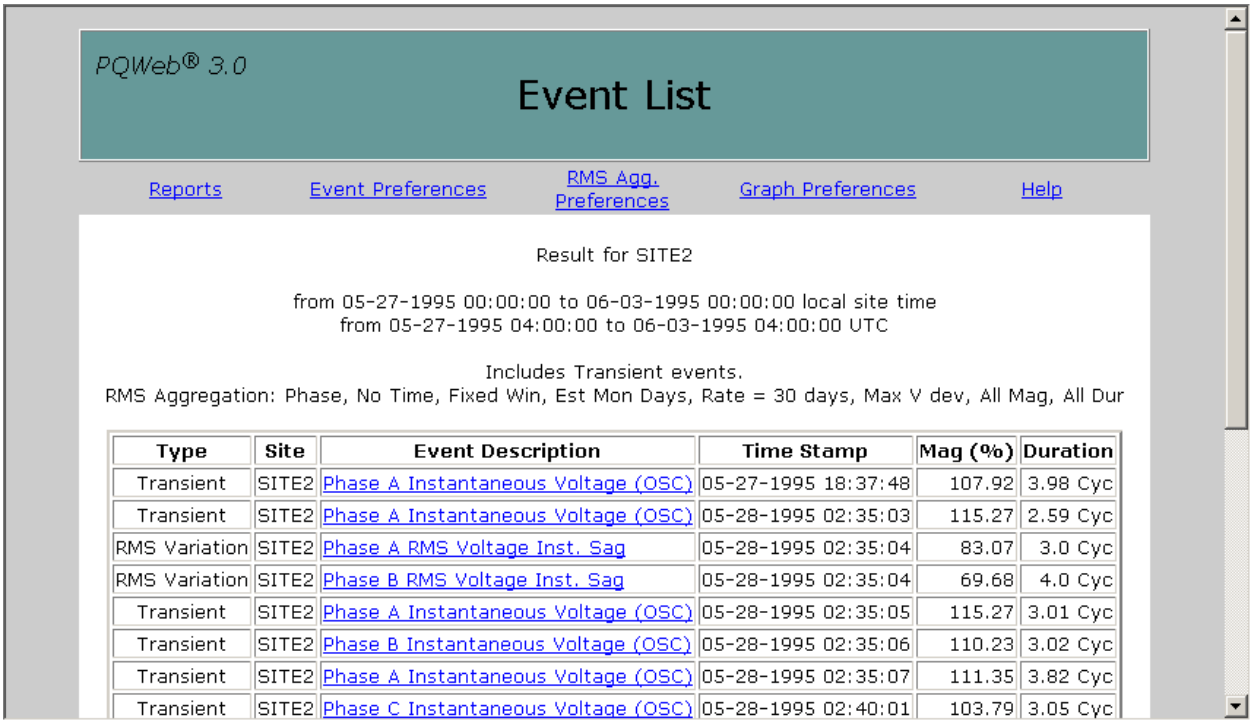
The query time range is padded to ensure that results for each site include at least the requested range in local time. For example, suppose the queried time range is 1000-1100 hours for two

sites. Site A is on U. S. Eastern Standard Time (5 hours behind UTC) and Site B is on U. S. Central Standard Time (6 hours behind UTC). The query time range will be adjusted to 1500-1700 hours UTC. The report will include events from 1000-1200 hours local time at Site A, and from 0900-1100 hours local time at Site B.

2.3. Event List Reports

When you select **Aggregated** from the Events listbox on the Reports page and click the Report button in the Events section (see Figure 3), a report similar to Figure 4 appears. This table lists RMS variations and/or transient events for the queried sites and date range. Click on an Event Description link to view a more detailed tabular summary, including graphs when available in the database.

The contents of the list are controlled by your choices on the RMS Aggregation Preferences page (see section 3.1) and the Event Display Preferences page (see section 3.2).


PQWeb® 3.0
Event List
Reports
Event Preferences
RMS Agg. Preferences
Graph Preferences
Help
Result for SITE2
from 05-27-1995 00:00:00 to 06-03-1995 00:00:00 local site time
from 05-27-1995 04:00:00 to 06-03-1995 04:00:00 UTC
Includes Transient events.
RMS Aggregation: Phase, No Time, Fixed Win, Est Mon Days, Rate = 30 days, Max V dev, All Mag, All Dur

Type	Site	Event Description	Time Stamp	Mag (%)	Duration
Transient	SITE2	Phase A Instantaneous Voltage (OSC)	05-27-1995 18:37:48	107.92	3.98 Cyc
Transient	SITE2	Phase A Instantaneous Voltage (OSC)	05-28-1995 02:35:03	115.27	2.59 Cyc
RMS Variation	SITE2	Phase A RMS Voltage Inst. Sag	05-28-1995 02:35:04	83.07	3.0 Cyc
RMS Variation	SITE2	Phase B RMS Voltage Inst. Sag	05-28-1995 02:35:04	69.68	4.0 Cyc
Transient	SITE2	Phase A Instantaneous Voltage (OSC)	05-28-1995 02:35:05	115.27	3.01 Cyc
Transient	SITE2	Phase B Instantaneous Voltage (OSC)	05-28-1995 02:35:06	110.23	3.02 Cyc
Transient	SITE2	Phase A Instantaneous Voltage (OSC)	05-28-1995 02:35:07	111.35	3.82 Cyc
Transient	SITE2	Phase C Instantaneous Voltage (OSC)	05-28-1995 02:40:01	103.79	3.05 Cyc

Figure 4 - Event list report.

2.3.1. Time Stamps - Time Zones and Daylight Savings Time

The time stamp of the measurement is expressed in local site time, including an adjustment for daylight savings time (DST) when applicable. For example, a measurement taken at Knoxville, TN, USA might be stored in the database with a time stamp of 1800 hours UTC on February 1. Since Knoxville is in the Eastern Time Zone, the local site time would be 1300 hours on February 1. If the UTC time stamp were 1800 hours UTC on July 1, the local site time would be 1200 hours because of the DST correction.

In the United States, Canada, and Mexico, daylight saving time begins at 2:00 AM on the first Sunday of April and ends at 2:00 AM on the last Sunday of October.

In most of the countries of western Europe, including the countries that are members of the European Union, daylight saving time begins at 1:00 AM GMT on the last Sunday of March and ends at 1:00 AM GMT on the last Sunday of October.

Daylight Saving Time - for the U.S. and its territories - is not observed in Hawaii, American Samoa, Guam, Puerto Rico, the Virgin Islands, the Eastern Time Zone portion of the State of Indiana, and by most of Arizona (with the exception of the Navajo Indian Reservation in Arizona).

In PQWeb, the local site time is computed from site characteristics stored in the database. The time zone at the Web server, or at the client browser computer, has no effect. However, the DST conversion rules (for example, USA or European Union) are set at the Web server.

2.3.2. Time Stamps - GPS

Some power quality meters synchronize their internal clocks periodically to a highly accurate time signal from the Global Positioning Satellite System. These events have their time stamps highlighted in red.

2.3.3. RMS Variations

The duration of an RMS variation is computed by determining the time that a particular voltage channel is above a voltage swell threshold or below a voltage sag threshold. Typically, these thresholds are 0.9 perunit for sags and 1.1 perunit for swells. They may be set at different values for individual sites in the database.

The preferences page for RMS Variation Aggregation, described in section 3.1, controls how sub-events may be grouped into the events listed.

2.3.4. Transient Type

Transient disturbances are caused by the injection of energy by switching or by lightning. The disturbance may either be *unidirectional*, or *impulsive* or *oscillatory*. Lightning, electrostatic discharge, load switching, or capacitor switching may cause a unidirectional transient. It is characterized by its peak value and rise time. An oscillatory transient is characterized by its frequency content, and may be caused by a switching operation such as the energization of a capacitor bank, distribution line, or cable, or the opening of an inductive current. Low and medium frequency oscillations, with principle frequencies less than 2 kHz, are normally caused by power system switching. The switching of a load close in proximity may cause high frequency oscillations with principle frequencies above 2 kHz. Common solutions to problems caused by transients include the application of surge arresters, passive and active filters, and isolation transformers.

2.3.5. Transient Duration

The process of computing transient duration begins by determining a duration for the waveshape fault. This done by applying a floating window waveshape fault detection algorithm to the data to determine an end-of-trigger point in the data. The detection algorithm is applied in reverse

chronological order to the data looking from the end of the record towards the beginning. There are three possible outcomes to this search:

1. A waveshape fault trigger is detected on the waveform at some point before (later in time than) the original initiating trigger is encountered. This is the case where a short but finite transient has occurred with the voltage returning to a steady state for at least one cycle before the end of the disturbance recording. The duration is calculated as the time difference between the triggers.
2. No waveshape fault trigger is detected because the transient did not end before the recording ended. In this condition, the trigger actually is detected but is the last point of the recording. The reported duration is the entire length of the recording, minus the pretrigger duration.
3. No waveshape fault trigger is detected before the original trigger is encountered. This can happen because the waveshape fault detection algorithm is not reflexive. In other words, using the same parameters, it may not yield the same results approaching from the end of the recording as from the beginning. This happens most often when the disturbance is small and very short in duration. The reported duration is the entire length of the recording.

This procedure is carried out for each voltage phase independently without regard to which phase actually caused the original trigger in the meter.

2.3.6. Transient Principal Frequency

Principal frequency is determined by performing a Fast Fourier Transform computation on the first cycle of transient data following the trigger point. The principle frequency is the spectral component with the highest magnitude with the fundamental removed. The value is useful for analyzing capacitor switching transients, which frequently will demonstrate the same frequency with each energization.

2.4. Shortcut Event Lists

The Events and RMS Variations listboxes on the Reports page also contains a number of Shortcut reports, which quickly return lists of events without performing aggregation. In the listbox, shortcut reports are designated with an asterisk (*).

Shortcut event list reports included in the Events section include:

- All Events
- All RMS Variation Events
- All Transient Events
- Transients > 110%
- Transients > 150%
- Transients > 175%
- Transients > 200%

Shortcut event list reports included in the RMS Variations section include:

- All RMS Variation Events
- RMS Variation Events > 120%
- RMS Variation Events > 110%
- RMS Variation Events < 90%
- RMS Variation Events < 80%
- RMS Variation Events < 75%
- RMS Variation Events < 50%
- RMS Variation Events < 10%

Shortcut event lists have a different format than the Aggregated event list, because less processing is performed on the data. Figure 5 shows a shortcut event list:

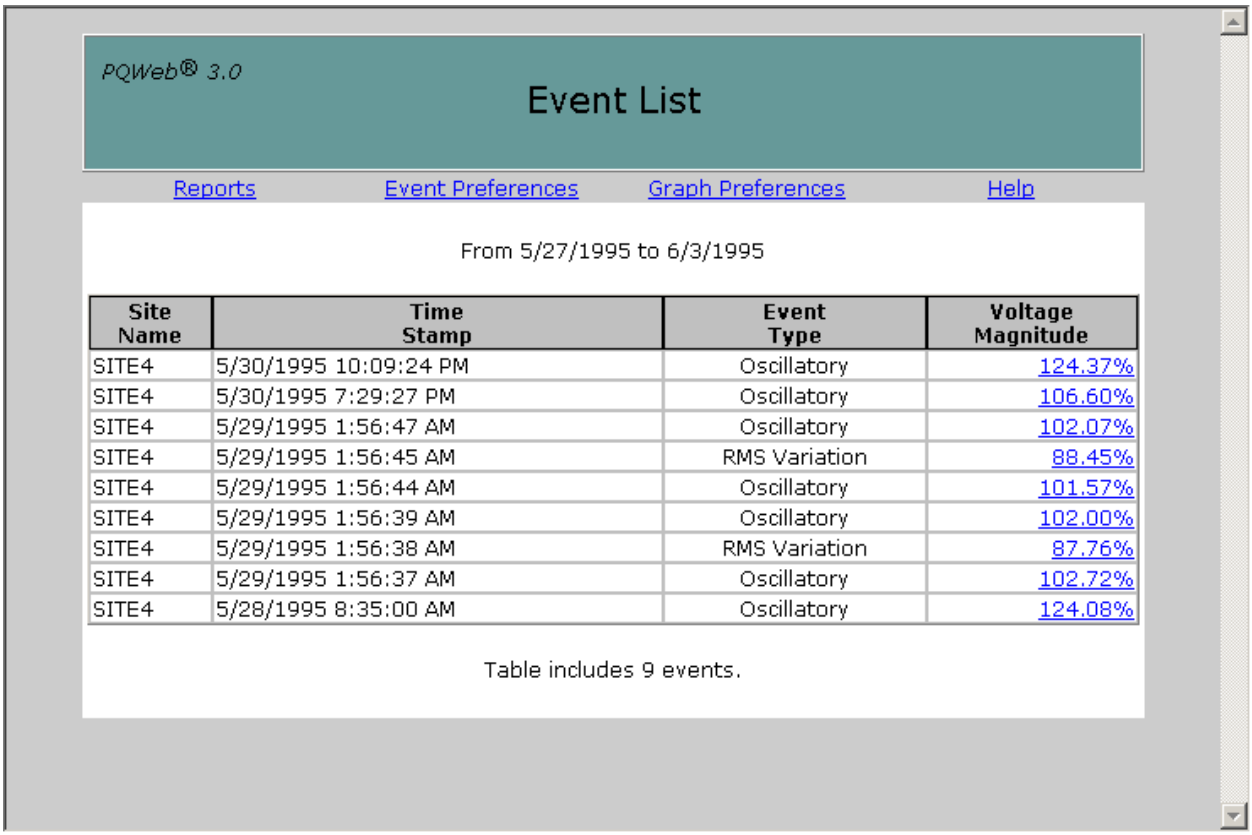


Figure 5 – Shortcut Event List

2.5. Event Report

If you click the Event Description link for an event in any of the event list reports, an Event Report containing a table and graphs will be displayed, as shown in Figure 6. An Event Report also appear when you click the link for an RMS variation, with some differences described later.

On the Graph Preferences page (section 3.3), there is a checkbox which controls whether the Event Report will be displayed in a new browser window or in the same browser window as the Event List.

PQWeb Event View

Transient (OSC)
SITE Z (1)
05-02-1995 09:39:54
Trigger at 0.00553385 on Vb Inst

Channel	Negative Peak	Positive Peak	Duration	Rise Time	Principle Freq
Va Inst	-172.29	168.28	3.66 Cyc	1.2370	420.0
Vb Inst	-126.50	164.15	3.66 Cyc	0.5859	900.0
Vc Inst	-168.51	170.75	3.66 Cyc	0.7161	540.0

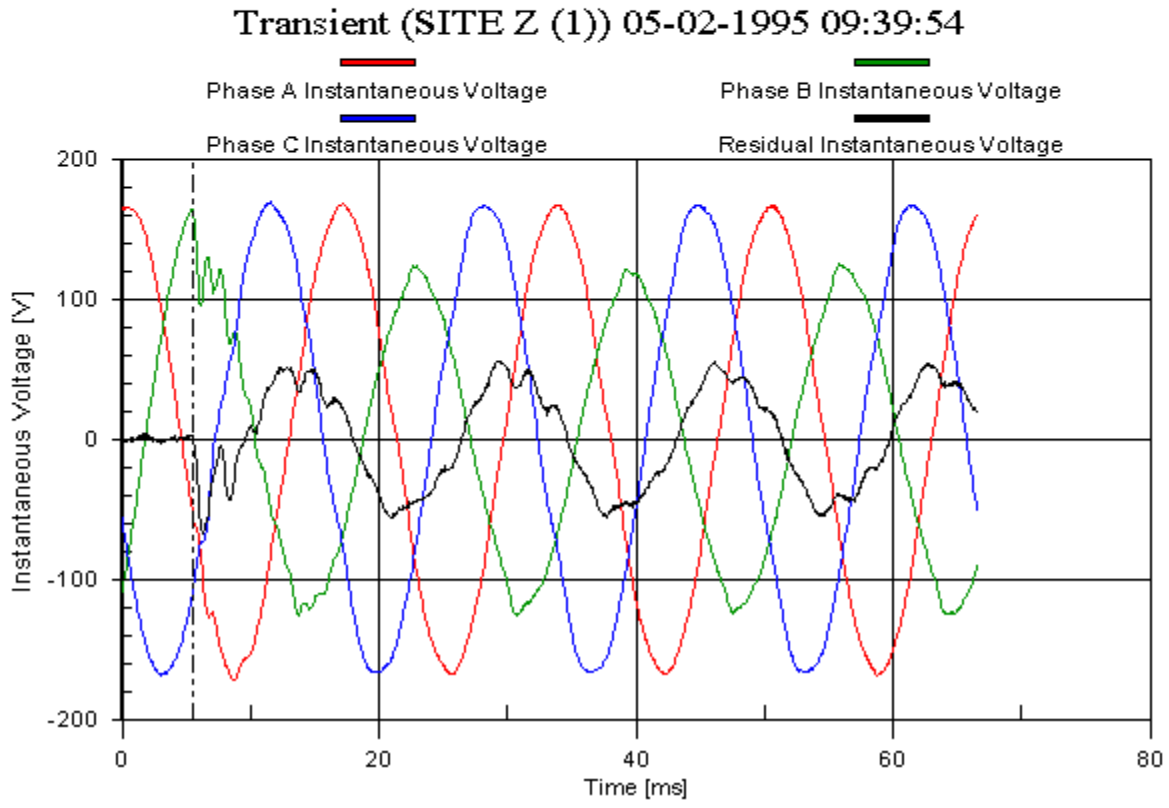


Figure 6 - Event view for a transient.

This page displays tabular and plotted output for transients and RMS variations. The report title block includes the event description, the site, date/time stamp, and the trigger time and channel when available. Settings on the Event Display Preferences page, described in section 3.2, determine which channels are plotted and the type of Y axis scale used. Settings on the Graph Preferences page, described in section 3.3, control the size, grid, and other visual aspects of the plot.

The table summarizes all recorded channels for this event, even if only some channels are plotted due to preference selections. The table for RMS variations will list all event sub-components individually, even if aggregation options are in effect. The triggered channel is highlighted in red.

The trigger time (where available) is plotted with a vertical dash-dot-dot line on the graphs. On voltage graphs for RMS variations, the site-specific thresholds for characterizing RMS variations are plotted with horizontal dash-dot-dot lines.

To customize these graphs, you can do any or all of the following:

- Click on the Graph Preferences link at the top of the report (section 3.3), change preferences, and click the Save button on that preferences page. The report will automatically regenerate using the new preferences.
- Click on the Event Preferences link at the top of the report (section 3.2), change preferences, and click the Save button on that preferences page. The report will automatically regenerate using the new preferences.
- Change Graph Customization options as described in the next section. Then click the **Regenerate Graphs** button on the Event Report Page to re-generate the table and graphs.

If you click the Event Description link for an RMS Variation in an event list report, the graphs will appear before the tabular summary, as shown in Figure 7. This example was created with aggregation in effect, so the plot shows two sub-events aggregated into the same event because they were only a few seconds apart. With sub-events, the tabular summary can be much longer, so it is placed below the graphs. RMS variation aggregation is described in section 3.1.

Many RMS variation events also have transient waveforms available. If these exist in the database, they will also be plotted below the RMS Variation plot.

PQWeb Event View

RMS Variation (Phase B RMS Voltage Inst. Sag)
SITE Z (1)
05-02-1995 09:39:55
Trigger at 0 on Vb RMS

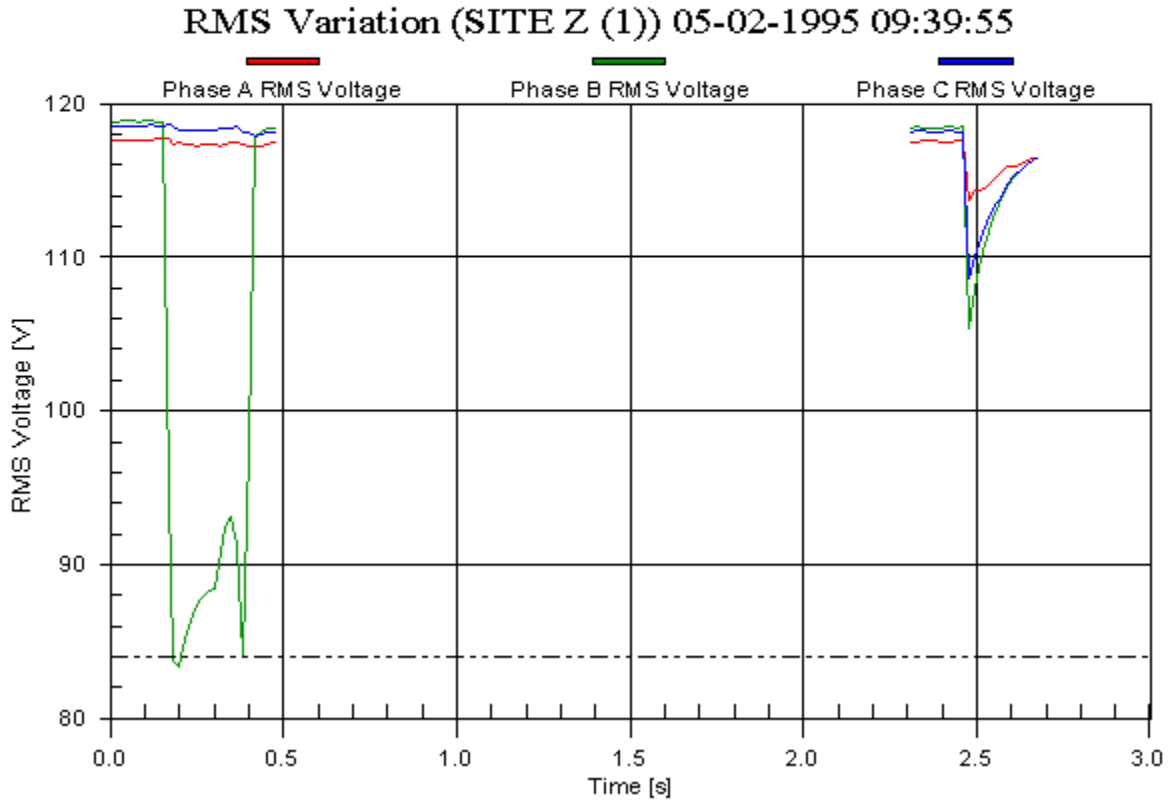


Figure 7 - RMS variation plot with sub-events.

2.6. Graph Zooming and PQDIF Download

Most of the graphs in PQWeb may be zoomed. These include transient waveforms, RMS variation traces, and steady-state trends. A zooming form appears underneath graphs that may be zoomed, shown in Figure 9.

The first row lets you change the X axis scale used for all graphs. The second and subsequent rows let you change the Y axis scale and user comments for individual graphs. The graphs are numbered from top to bottom as they appear on the page.

- **X axis Manual Scale** - turn off the autoscale checkbox, and enter the minimum and maximum X axis values for manual scaling. The edit fields display the currently plotted minimum and maximum scale values.
- **Y axis Manual Scale(s)** - turn off the autoscale checkbox, and enter the minimum and maximum Y axis values for manual scaling of a graph. The edit fields display the currently plotted minimum and maximum scale values. Note that if stacked axes or stacked graph preferences are in effect, the manual scale applies to all such axes in the graph. The Y axis manual scale works best with the separate or superimposed graph preferences.
- **User Comment(s)** - enter an optional subtitle for each graph. The edit fields display any current user comments for each graph. Depending on graph preferences, this comment appears as a subtitle either above or below the plot area.

If you make preference changes such that the number of graphs in the re-generated report will change, then any mismatched custom Y axis zooms and user comments will be used in the order entered.

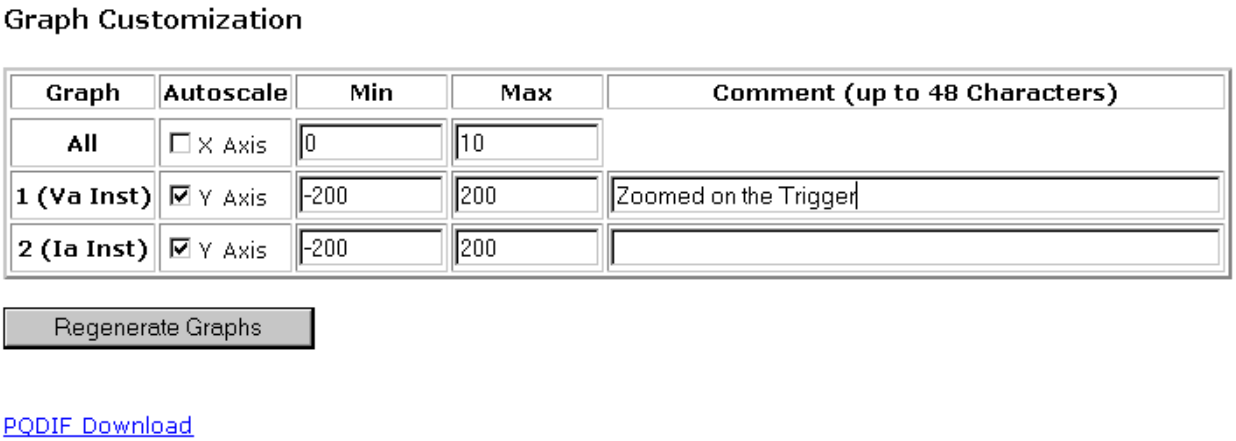


Figure 8 - Graph zooming form.

After making changes as shown in Figure 8, the transient plot from Figure 6 is zoomed and subtitled as shown in Figure 9.

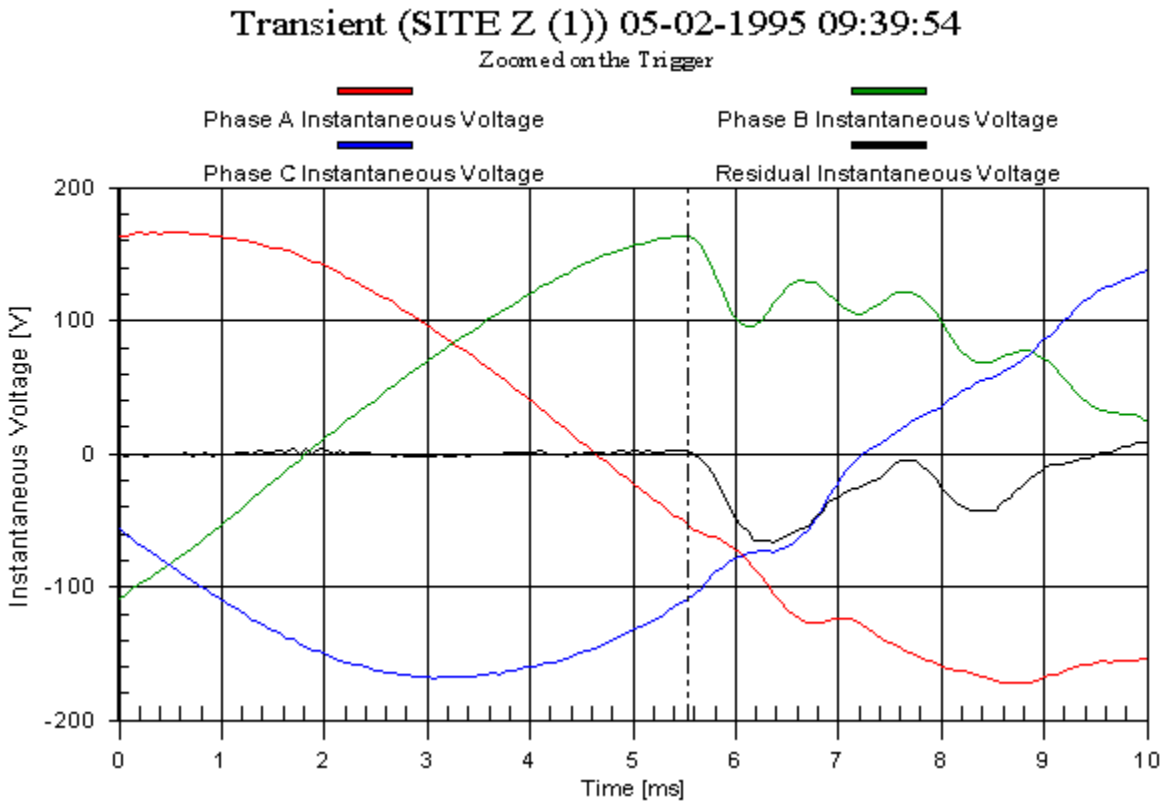


Figure 9 - Zoomed transient graph with a custom label.

You can download any data plotted in PQWeb, including data that may not be zoomed, by clicking on the PQDIF Download link as shown in Figure 8. You will have an opportunity to save the PQDIF file to disk, or open it directly in a PQDIF viewing program.

A free PQDIF viewing program for 32-bit Windows may be downloaded from www.pqsoft.com/top. More information on PQDIF is available at http://grouper.ieee.org/groups/1159/3/ .

2.7. RMS Variation Report

Select “RMS Summary” in the RMS Variations listbox and press the Reports button in the RMS Variations section of the Reports page to create an RMS Variation Summary report, as shown in Figure 10. The upper portion summarizes the query parameters and aggregation options. In this example, only the scatter plot has been included in the report.

PQWeb RMS Variation Summary

Result for 4 sites

from 10-01-1994 00:00:00 to 10-05-2000 00:00:00 local site time
from 10-01-1994 04:00:00 to 10-05-2000 04:00:00 UTC

RMS Aggregation: Phase, No Time, Fixed Win, Est Mon Days, Rate = 30 days, Max V dev, Sags, All Dur

Magnitude-Duration Plot

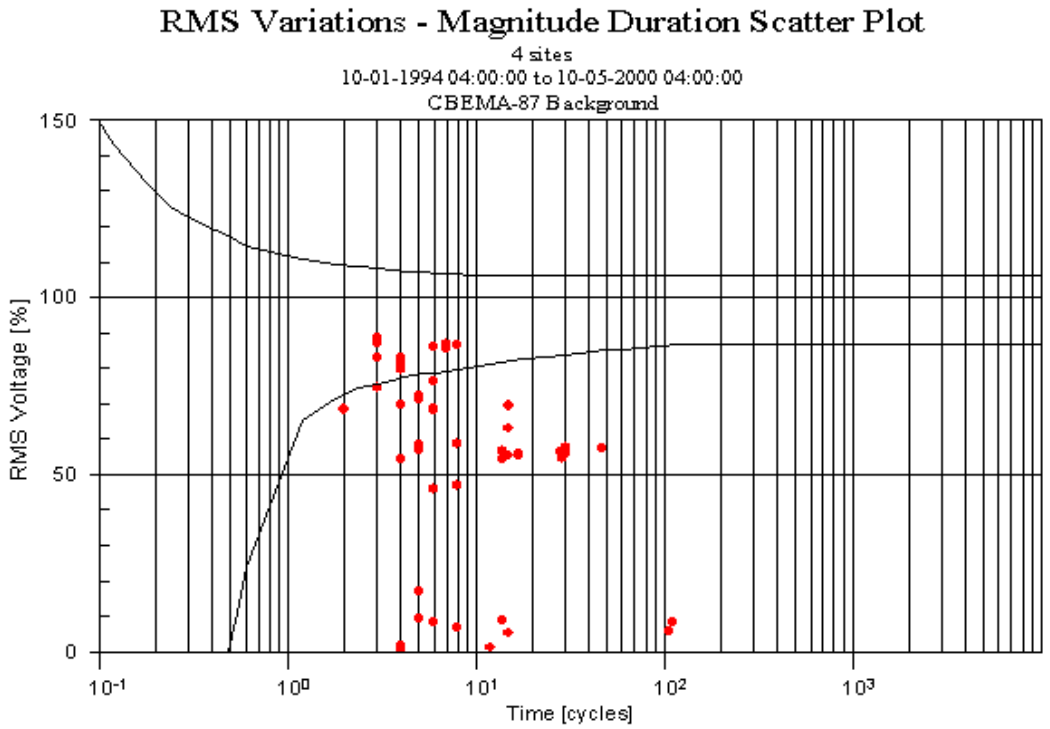


Figure 10 - Scatter plot from the RMS varation report.

This report contains up to four elements, determined by your selections on the RMS Variation Display Preferences page described in section 3.1:

- Event List - provides access to plots and file downloads of individual RMS variation events.
- Magnitude-Duration Plot - each event is plotted on a scatter chart, with a reference background curve.

- Histogram Table - collects individual events into a histogram of counts (or rate) per magnitude and duration bin.
- 3D Histogram Plot - a bar chart of the histogram data.

The histogram table and plot vertical axis units will be raw event count, unless you have entered a non-zero choice for User Rate on the Aggregation Preferences page (see section 3.1). With a user rate of 30 days, for example, the histogram units would then be events per 30 days. Choices made on the Monitor Days Preferences (section 3.4) page affect this normalization.

To change this report, you can do any or all of the following:

- Click on the RMS Agg. Preferences link at the top of the report. Change any of the settings on the RMS Summary Preferences page (section 3.5), and click the Save button on that preferences page. The report will regenerate automatically using the new preferences.
- Toggle the option to include steady state records on the Monitor Days Preferences page. (You can access this preferences page by returning to the Reports page). This will affect the denominator (monitor days) for normalized indices. Then click the Reports button in the RMS Variations section on the Reports page to re-generate the RMS Summary report.

2.8. Steady State Report

Steady State Trend reports present a timeline of data from any channel that you choose, over a specified time range. Depending upon the channel, the available data my consist of single values or Min / Average / Max envelopes.

To create a Steady State report, select the channel(s) using the Trend Channels Preferences page (section 3.5). Then select “Steady State” from the Trends listbox at the bottom of the Reports page and click the Reports button under it. An example report is shown in figure 11.

Depending on the preferences and channels selected, the report may include one or more trend plots vs. time, as in Figure 11. The report may also include histogram and cumulative probability plots of the steady state samples, illustrated in Figure 12. The types of plots that appear, trend or histogram, and the phase aggregation or superposition on the plots, are all set on the Trend Display Preferences page described in section 3.6.

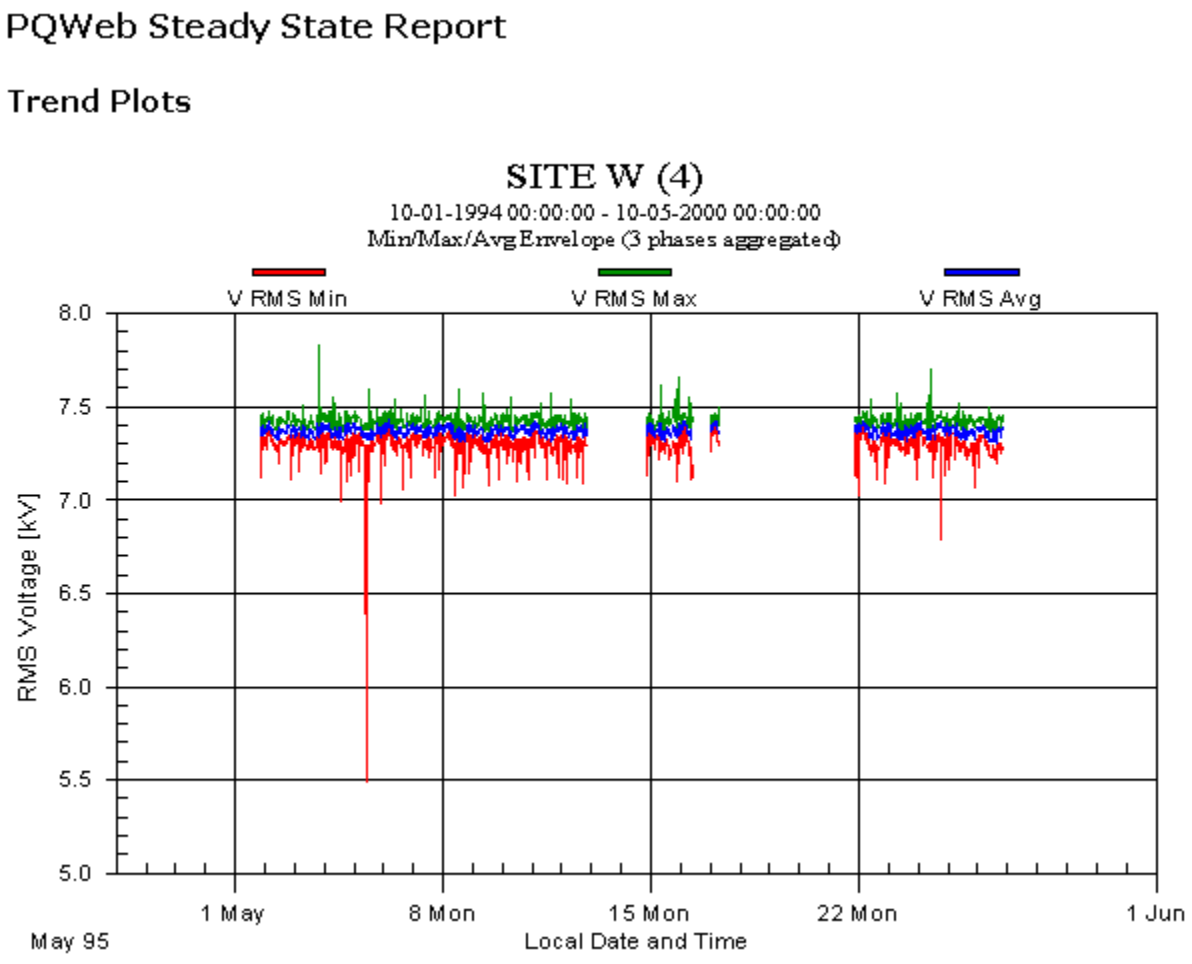


Figure 11 - Steady state trend plot.

The report displays tabular and plotted output for steady-state measurements. In trend plots, a vertical grid line plotted for a date is always midnight local time. Trend plots may include gaps

in the data, or individual data points, where it appears that a regular series of samples was interrupted. If the interval between samples increases by more than a factor of 2, PQWeb assumes a gap in the data. Figure 11 shows three gaps of missing data.

Multiple-Site Aggregated Trends

If a Trend report is created when more than one site is selected, the data from the multiple sites is aggregated as follows:

- For Current and Power channels, the data is summed. This allows you to create a report of the total current or power flowing through several instruments.
- For other channels, such as Voltage or Temperature, the data is averaged.

Trend Shortcut Reports

Several shortcut reports are also available in the Trends listbox on the Reports page. These reports use the site and time range selections you have made, but do not require you to select channels or set preferences. Each trend shortcut uses a preselected set of channels and preferences. Shortcut trends never aggregated data between sites or by time. If multiple sites are selected for a shortcut trend, separate plots are generated for each site.

The available Trend Shortcut Reports include:

- 1 Phase Voltage – Plots RMS Voltage with values and envelopes superimposed for phases A, B, and C.
- 3 Phase Voltage – Plots RMS Voltage with values superimposed, and envelopes plotted separately for phases A, B, and C.
- 1 Phase Current – Plots RMS Current with values and envelopes superimposed for phases phases A, B, and C.
- 3 Phase Current – Plots RMS Current with values superimposed, and envelopes plotted separately for phases A, B, and C.
- 3 Phase Voltage and Current – Plots both RMS Voltage and RMS Current, with values superimposed and envelopes plotted separately for phases A, B, and C.
- 1 Phase Power – Plots Real Power with values and envelopes superimposed for phases A, B, and C.
- 3 Phase Power – Plots Real Power with values superimposed, and envelopes plotted separately for phases A, B, and C.
- Harmonic – Plots Harmonic RMS Voltage and Harmonic RMS Current for phases A, B, C, AB, BC, and CA.
- Frequency – Plots the voltage frequency.
- Flicker – Plots Short-term and Long-term Flicker Severity value for phases A, B, C, AB, BC, and CA.
- Energy – Plots three-phase cumulative watt-hours, and three-phase watt-hours consumed in each time interval. Also plots cumulative and interval var-hours and VA-hours if the data is available.

- Imbalance – Plots voltage and current magnitude imbalance, defined as the maximum deviation from the average of the three phases, normalized by the average of the three phases.
- Unbalance – Plots the negative-sequence and zero-sequence unbalance for voltage and current.

Customizing Trend Reports

To customize the graphs, you can do any or all of the following:

- Click the Graph Preferences link at the top of the report, change the preferences (section 3.3), and click the Save button on that preferences page. The report will automatically regenerate using the new preferences.
- Click the Trend Preferences link at the top of the report, change the preferences (section 3.6), and click the Save button on that preferences page. The report will automatically regenerate using the new preferences.
- Click the Channels link at the top of the report, change your channel selection(s) (section 3.5), and click the Save button on that preferences page. The report will automatically regenerate using the newly selected channels.
- Change Trend Graph Customization options as described below. Then click the **Regenerate Graphs** button on the Steady State Report Page to re-generate the table and graphs.

2.8.1. Harmonics

Harmonic components are plotted by choosing a voltage or current spectrum channel, and entering an integer harmonic order, on the Trend Display Preferences page, see section 3.6. When plotting harmonic components, there may be zero values plotted if there is no value recorded for that component at the sample time, but there are values for other harmonic components at the same sample time. Because the database only stores significant levels of harmonic components, this condition indicates that a harmonic measurement was taken at the sample time, but did not include a significant level of the specified harmonic component.

2.8.2. Values and Min/Max/Avg Envelopes

The steady-state data may consist of value series and/or envelope series. A value series is a set of snapshot measurements at the specified sample times. An envelope series is a record of continuously updated minimum, maximum, and average values of a channel measurement. The envelope values are recorded periodically, and then reset for the next sample interval. If a steady state query returns no data, make sure that both Values and Min/Max/Avg are checked on the Steady State Display Preferences page; this will return both types of data if they exist for the channel. If the query still returns no data, check the Monitor Availability report and also the phase selections (line-to-ground vs. line-to-neutral). It may also be that the requested channels are truly not measured at the site in question.

2.8.3. Steady State Phase Aggregation

When trend plotting two or three phases for a channel, the phases may be plotted separately, superimposed, or aggregated (for an envelope series). With superimposed value trend plots, there will typically be 3 color-coded traces on the graph, one for each phase. With superimposed envelope trend plots, there will typically be 9 color-coded traces, one for the min, max, and average of each phase. With aggregated envelope plots, there will always be 3 traces, one for the min, max, and average of the aggregated phases. In this case, the minimum will be the lowest minimum value among all phases, the maximum will the highest maximum value among all phases, and the average will be the weighted average of the phase average values.

The histogram grouping options for two or three phases are similar to the separate vs. aggregated option for envelope trend plots. With the separate option, each phase will have a separate histogram. With the aggregated option, all phases for a channel will be combined into one histogram.

2.8.4. Steady State Trend Zooming

The Trend Graph Customization options appear in a table below the last trend graph. The appearance and operation of this form is similar to that shown in Figure 8. The difference for trends is that you enter min and max dates for the X axis, in the same format used for the query page.

The first row lets you change the X axis (date and time) scale used for all trend graphs. The second and subsequent rows let you change the Y axis scale and user comments for individual trend graphs. The trend graphs are numbered from top to bottom as they appear on the page.

- **X axis Manual Scale** - turn off the autoscale checkbox, and enter the minimum and maximum X axis date and time values for manual scaling. The edit fields display the currently plotted minimum and maximum scale values.
- **Y axis Manual Scale(s)** - turn off the autoscale checkbox, and enter the minimum and maximum Y axis values for manual scaling of a graph. The edit fields display the currently plotted minimum and maximum scale values. Note that if stacked axes or stacked graph preferences are in effect, the manual scale applies to all such axes in the graph. The Y axis manual scale works best with the separate or superimposed graph preferences.
- **User Comment(s)** - enter an optional subtitle for each trend graph. The edit fields display any current user comments for each graph. Depending on graph preferences, this comment appears as a subtitle either above or below the plot area.

If you make preference changes such that the number of trend graphs in the re-generated report will change, then any mismatched custom Y axis zooms and user comments will be used in the order entered.

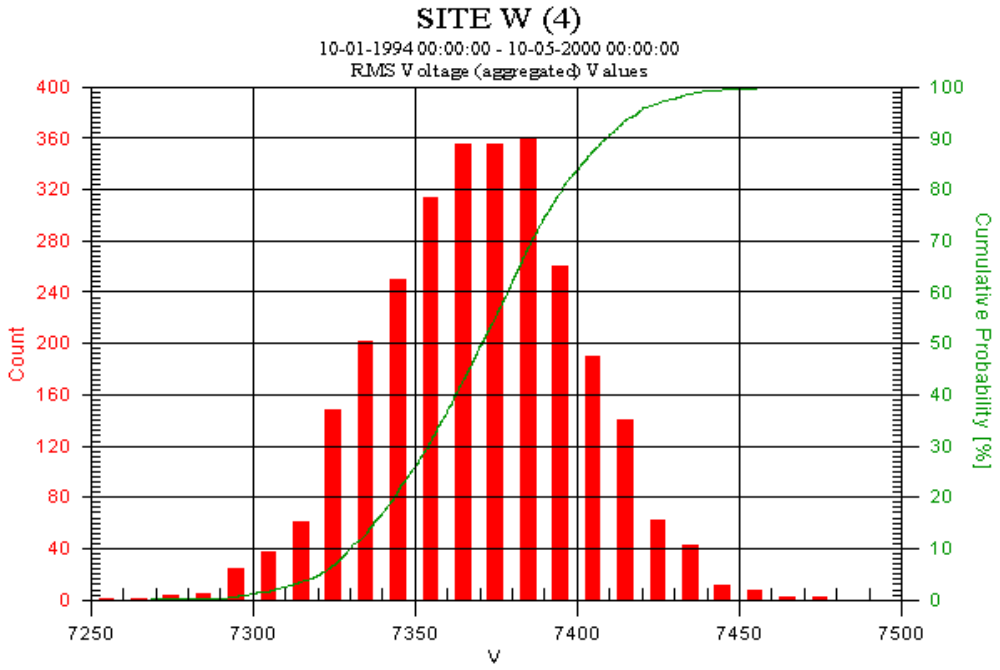
2.8.5. Histograms and Probability Tables

The histogram plot Y axis scaling is always automatic, and will always contain 10 grid divisions. The histogram X axis scaling can be changed with a manual bin size entered on the Steady State Display Preferences page.

The last report item is a statistical summary table of all value and envelope channels requested for either trend plots or histogram plots. See the bottom of Figure 12 for an example. This table contains several values based on histogram data, and the summary table appears even when histogram plots are not requested. The CP values in the table are cumulative probability values that could have been read from the histogram plot. For example, CP5 is the value that 5% of the samples were less than.

If the report includes histogram plots, there is a second **Regenerate Graphs** button at the bottom of the page. Clicking this button will regenerate the report with any changes made to the preference pages. However, this button does not include any manual scaling entered on the Trend Graph Customization form; automatic scaling is always used.

Histogram Plots



Statistical Summary

Site: SITE W (4)
Histogram Summary for Aggregated Phases
10-01-1994 00:00:00 to 10-05-2000 00:00:00

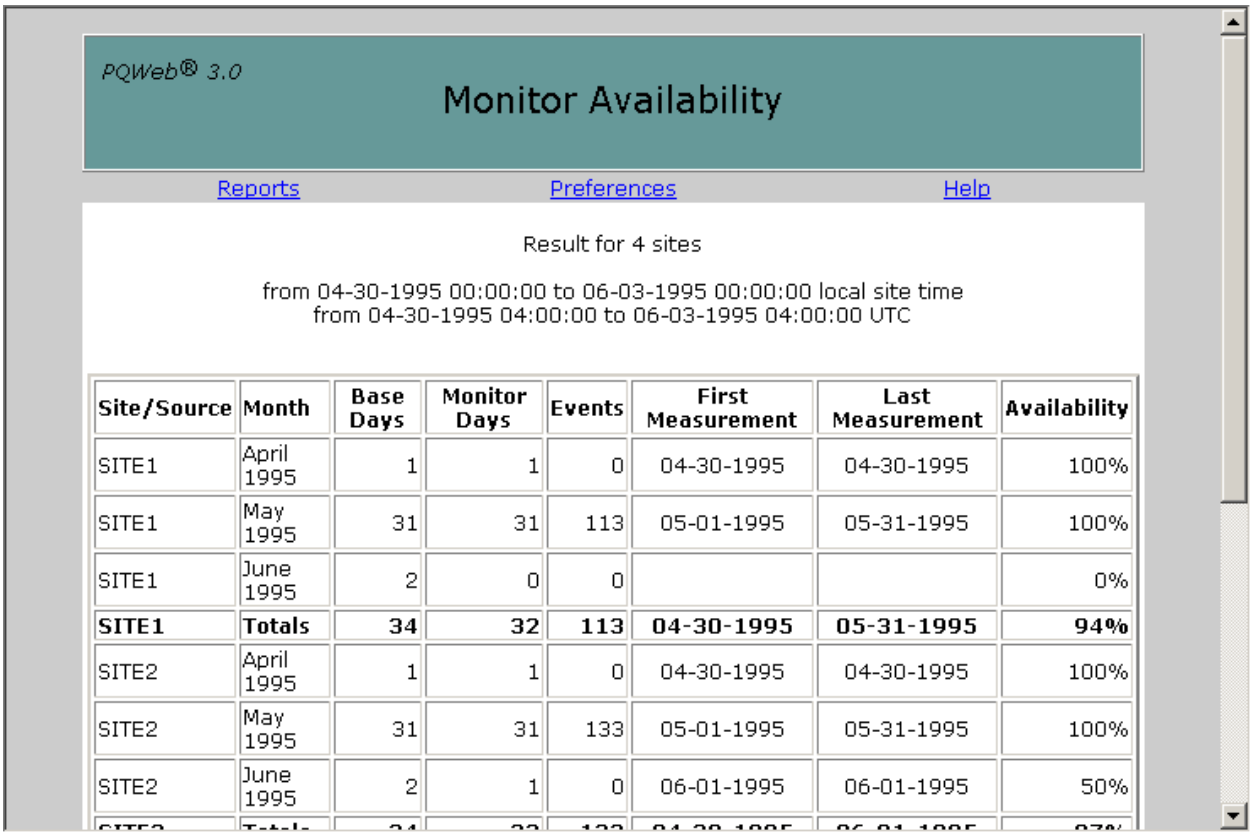
Channel	# Samples	Min	Max	Avg	StDev	CP5	CP50	CP95	CP96	CP99
V RMS Values [V]	2835	7256.84	7473.01	7369.90	30.40	7320.86	7370.71	7418.76	7421.23	7437.15

Figure 12 - Steady state histogram with cumulative probability.

2.9. Monitor Availability Report

To create a Monitor Availability report, select “Monitor Availability” from the listbox in the Other section at the bottom of the Reports screen, then click the Report button under the listbox. The report is illustrated in Figure 13.

This report estimates the number of days that PQ monitors were collecting data for each site and month. The day begins at midnight (00:00:00) and ends at 23:59:59. If a steady-state measurement of any voltage quantity was taken at any time during the day, the monitor is considered available on that day. If an event trigger (transient or RMS variation) was recorded at any time during the day, the monitor is likewise considered available on that day.



PQWeb® 3.0

Monitor Availability

Reports Preferences Help

Result for 4 sites

from 04-30-1995 00:00:00 to 06-03-1995 00:00:00 local site time
from 04-30-1995 04:00:00 to 06-03-1995 04:00:00 UTC

Site/Source	Month	Base Days	Monitor Days	Events	First Measurement	Last Measurement	Availability
SITE1	April 1995	1	1	0	04-30-1995	04-30-1995	100%
SITE1	May 1995	31	31	113	05-01-1995	05-31-1995	100%
SITE1	June 1995	2	0	0			0%
SITE1	**Totals**	**34**	**32**	**113**	**04-30-1995**	**05-31-1995**	**94%**
SITE2	April 1995	1	1	0	04-30-1995	04-30-1995	100%
SITE2	May 1995	31	31	133	05-01-1995	05-31-1995	100%
SITE2	June 1995	2	1	0	06-01-1995	06-01-1995	50%

Figure 13 - Monitor availability report.

Note that a trend plot could show an obvious gap in measurements from 18:00 one day to 10:00 the next day. Such a gap would not show up on this Monitor Availability report, because measurements were taken at some time during both days.

This report assumes that you expect monitors to be available throughout the queried date range. This may result in "extra" months with zero availability at the beginning or end of the report. The summary availability percentage for the site is affected by these empty months, so you may wish to run the query again with a tighter date range.

2.9.1. Steady State Records

Because of the excessive processing time that would result, PQWeb does not unpack steady state records to examine individual monitor days. Most PQView databases store steady-state trend data in packed weekly records. In some cases, the record length may be shorter depending on how data was imported. Due to the way PQWeb calculates monitor days, monitor availability will be overestimated if the monitor was out of service for a few days within a weekly record. Typically, this overestimate might be 10%. Options for dealing with this issue include:

- Turn off consideration of steady state records on the Monitor Days Preferences page. This will probably underestimate the availability.
- Some newer PQView databases have monitor event records, described under the next heading. These allow efficient monitor availability calculations with a daily granularity.
- Accept this level of inaccuracy.

2.9.2. Monitor Event Records

Some newer PQView databases have "monitor event" records added for each day that a steady state measurement was taken, whether or not a transient or rms variation was recorded. These records allow the calculation of daily monitor availability without unpacking the steady state records. They are not counted in the totals of "triggered events". If the database appears to have these records, a note will appear at the bottom of the report. You can then turn off consideration of steady state records on the Monitor Days Preferences page, with no loss of accuracy and some performance improvement.

3. User Guide to Preferences

PQWeb reports are configured using six preference setting pages. They are accessed from links on the Reports menu, under the Report button for each type of report. Links to the appropriate Preferences pages are also supplied in the top menu for each report page, so that preferences can be changed without returning to the Reports page.

Each of the preference pages operates in a similar fashion. After making any changes, **the Save button must be clicked** or the changes will not take effect. Changes made on these pages are saved in a cookie, and restored in subsequent sessions. Each preferences page has a help link.

3.1. Preferences for RMS Variation Summary

This set of preferences affects data preparation for both Event List and RMS Summary reports. Changes here may affect the number, duration, and magnitudes of reported RMS variations. The PQView Tech Note #97-2 describes RMS variation aggregation. Tech Note #97-3 discusses other impacts on the characterization of RMS variations.

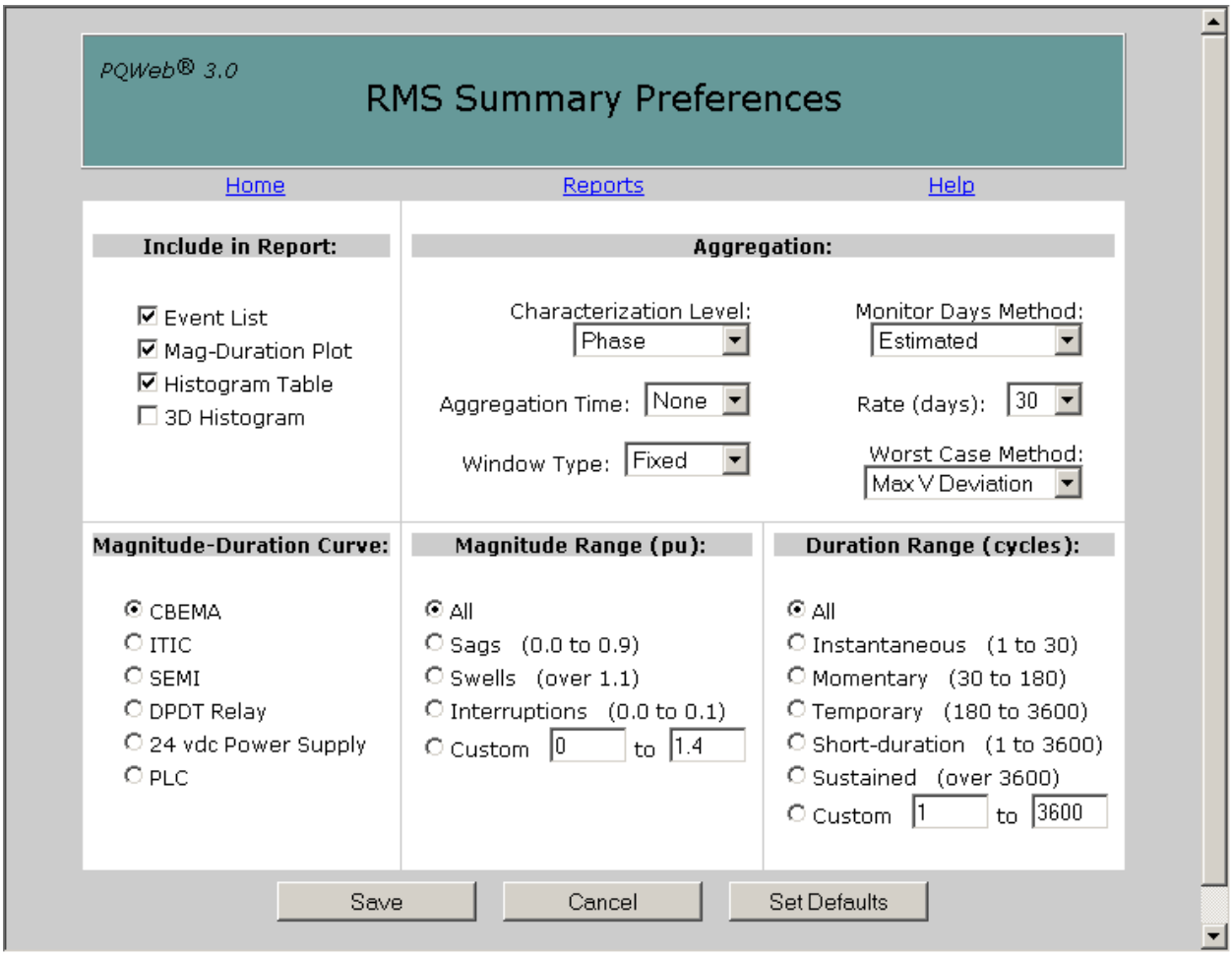


Figure 14 – RMS Summary Preferences page

- **Include in Report** - the report may include an event list with times, magnitudes and durations; a magnitude-duration scatter plot; a histogram table; and/or a histogram plot. At least one must be chosen.
- **Magnitude-Duration Curve** - for the magnitude-duration scatter plot, a benchmark curve will be plotted in the background. This may be the CBEMA (Computer Business and Equipment Manufacturers Association), the ITIC (Information Technology Industry Council, formerly CBEMA), the SEMI Std. 2844A, or one of the curves defined in IEEE 1346-1998.
- **Characterization Level** - measurements are stored in single-phase components. They may be characterized using a hierarchy of aggregation methods.
    - Phase Aggregation, the most basic level, in which measurement components are aggregated to find the worst component on each phase.
    - Measurement Aggregation, the next level, in which the worst phase is used.
    - Temporal Aggregation, the highest level, in which events with small time separation may be aggregated into one event.
- **Aggregation Time** - allows you to set a time range for collecting measurement components into one aggregate event.
- **Window Type** - allows the aggregation time to vary, depending on the time separation between events.
- **Monitor Days Method** - no normalization means the RMS variation counts are reported as raw data. With normalization, the raw counts are multiplied by the monitoring period and divided by the Rate to report counts per month, quarter, half year, or full year. Estimated normalization uses the from and to dates of the query to define the monitoring period. Exact normalization refines this by eliminating days in which no events or steady-state measurements were recorded. Also see the Monitor Days Preferences page.
- **Rate** - choose the number of days (30, 90, 180, or 365) to normalize the counts in conjunction with the monitoring period as determined from the Monitor Days Method.
- **Worst Case Method** - controls the selection of the worst component or phase during aggregation.
    - Max V Deviation - may select a sag or swell, whichever has the largest perunit deviation from 1.0.
    - Max V*S Area - selects a sag or swell with maximum volt-time product above or below 1.0 perunit.
    - Min V - selects the worst perunit sag.
    - Max V - selects the worst perunit swell.
    - UNIPEDE DISDIP - constructs a sag with worst voltage deviation and maximum duration recorded.

- **Magnitude Range** - choose a voltage magnitude range (per-unit) to include in the report, or enter a custom range in the edit fields.
- **Duration Range** - choose a duration range (cycles) to include in the report, or enter a custom range in the edit fields.

After you click **Save**, any changes take effect for the next query or graph request. If you accessed this page from the menu link on an RMS Summary Report page, the report will be automatically regenerated using the new preferences.

3.2. Event Display Preference

This set of preferences affects the Event List report.

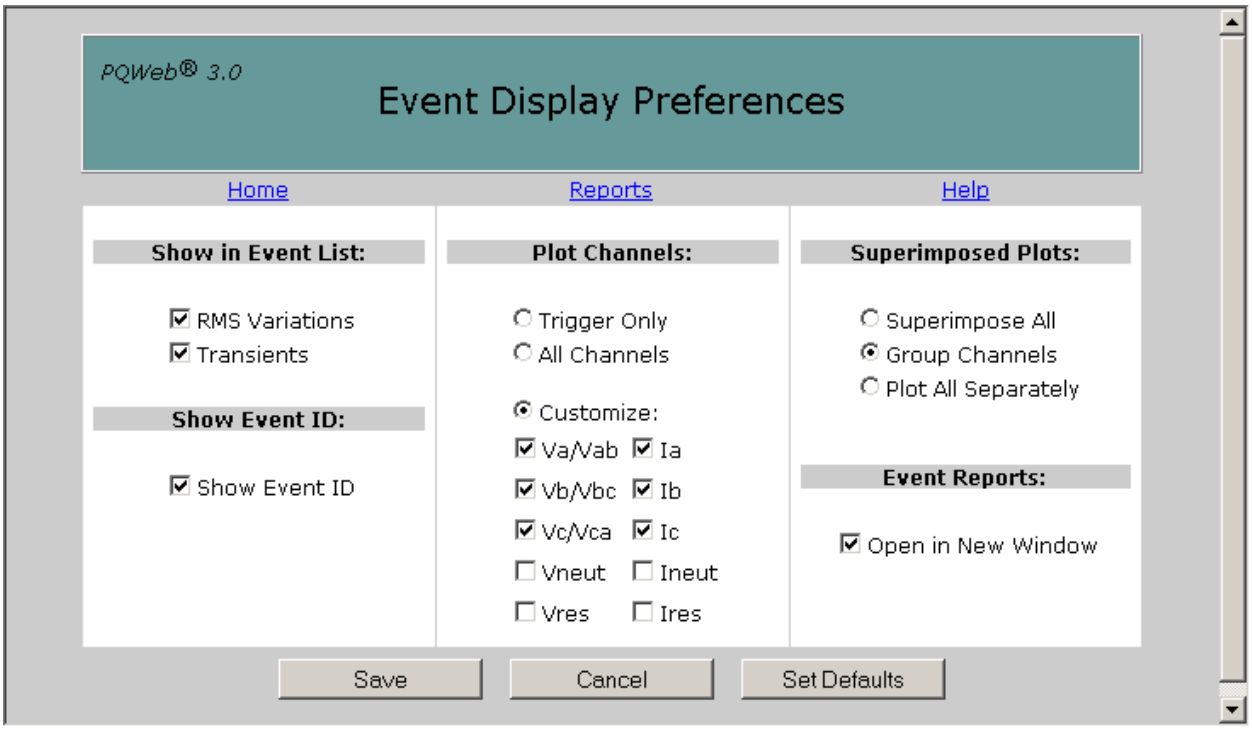


Figure 15 – Event Display Preferences page

- **Show in Event List** - choose to include Transients or RMS Variations in the list of events. One or both may be selected.
- **Show Event ID** – If this box is checked, the database event ID number will be included at the lower left corner of the plot in Event Reports.
- **Plot Channels** - for event plots, you may include just the triggered channel, all recorded channels, or a set of selected channels.
- **Superimposed Plots** - when more than one channel is plotted, you can have each channel on a separate graph, or all channels on the same graph. The Group Channels option will plot all voltages on one graph, and all currents on a second graph. Also see the Multiple Curve options under Graph Preferences, especially when mixing voltages and currents on the same graph.

- **Event Reports** – Select the checkbox to open event reports in a new browser window. Clear the checkbox to open the reports in the same browser window as the event list.

After you click **Save**, any changes take effect for the next query or graph request. If you accessed this page from a menu link on a report page, the report will be automatically regenerated with the new preferences.

3.3. Graph Preferences

This set of preferences affects all graphs.

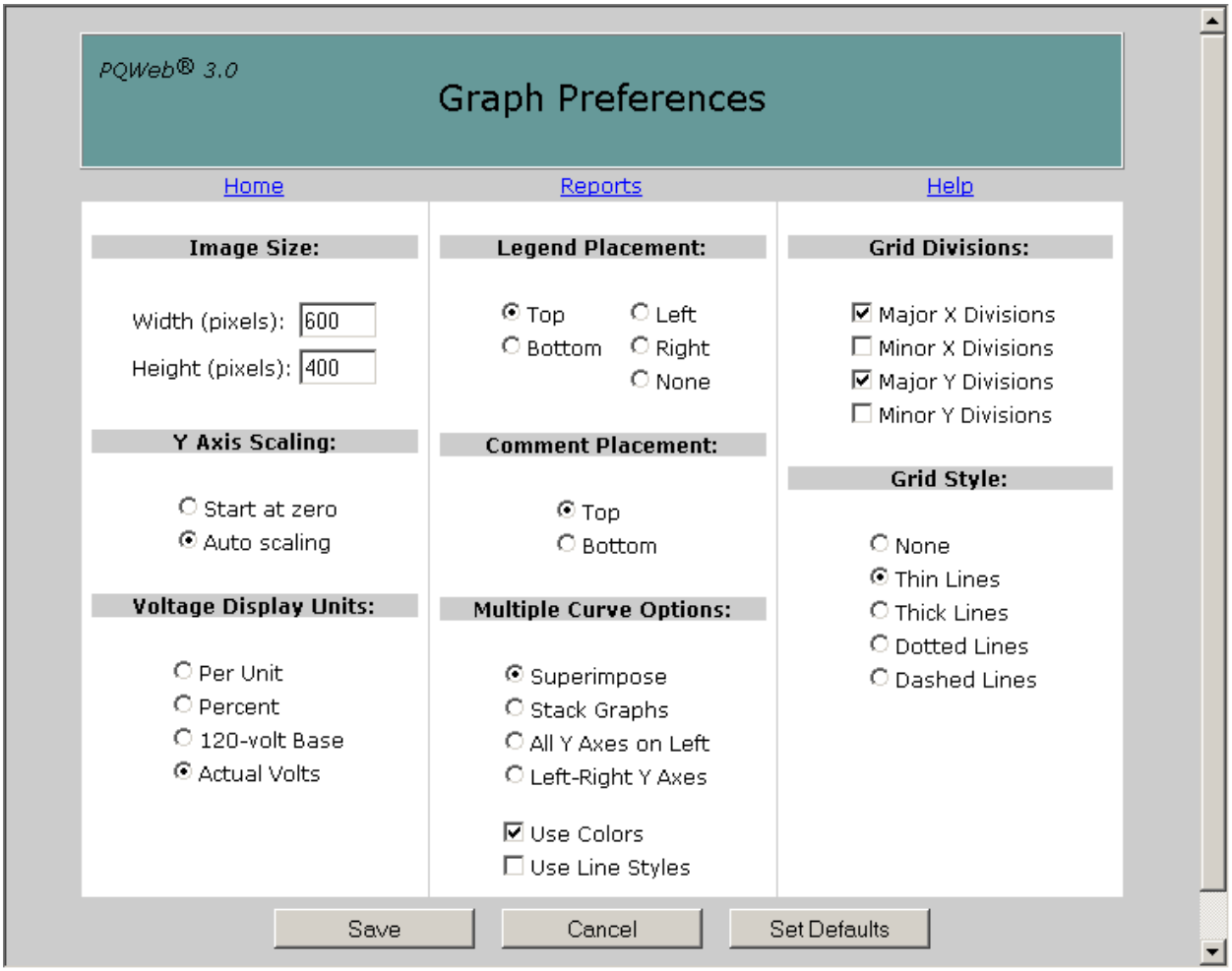


Figure 16 – Graph Preferences page

- **Image Size** - all report graphs will be the same size, in pixels, as specified here. You can make the graphs larger to take advantage of your screen resolution, but larger images take longer to download.
- **Y Axis Scaling Options** – controls whether trend and RMS plots will be automatically scaled in the Y axis, or whether the Y axis will always start at zero.
- **Voltage Display Units** - you may plot voltages in per-unit on the Site nominal base, in percent of nominal voltage, in actual volts, or normalized to a 120-volt base. This

preference applies to all instantaneous and RMS voltage channels in Event plots, RMS Variation plots, and Steady State Trend plots.

- **Legend Placement Options** - for graphs with multiple curves, the legend can be omitted, or placed on any of the four sides of the graph. The legend never appears for a graph with just one curve.
- **Comment Placement Options** - the graph zoom report allows you to add a label or comment, which appears as a sub-title either above or below the graph.
- **Multiple Curve Options** - if more than one curve appears on the graph, they always use the same X axis. Superimpose will force them all to use the same Y axis. Stack Graphs will produce a small sub-graph for each curve, with separate Y axes. All Y Axes on Left will provide a separate Y axis for each curve. Left-Right Y axes will provide separate Y axes for two curves. The check boxes for Use Colors and Use Line Styles will produce automatically varied colors and line styles for the multiple curves and Y axes on the graph. The Event Display and Trend Display preferences control whether multiple curves actually appear on the graphs
- **Grid Division Options** - toggles the display of major and minor grid lines for the X and Y axes. When grid lines are turned off, tick marks are used instead.
- **Grid Style Options** - controls the line style and thickness for grid lines.

After you click **Save**, any changes take effect for the next query or graph request. If you accessed this page from a menu link on a report page, the report will be automatically regenerated with the new preferences.

3.4. Monitor Days Preferences

This check box allows you to turn off consideration of steady state records in the monitor availability calculation. This choice affects the monitor availability report, and the normalized RMS variation indices.

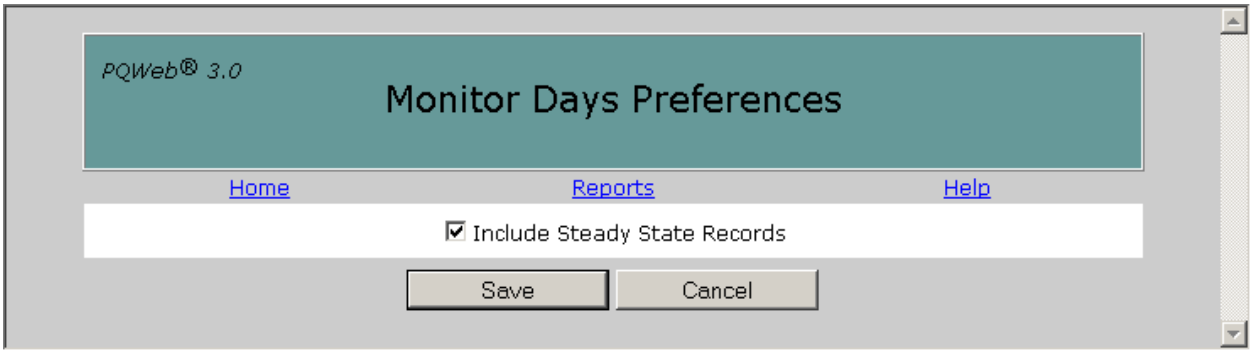


Figure 17 – Monitor Days Preferences page

After you click **Save**, any changes take effect for the next query or graph request. If you accessed this page from a menu link on a report page, the report will be automatically regenerated with the new preferences.

3.4.1. Steady State Records

Because of the excessive processing time that would result, PQWeb does not unpack steady state records to examine individual monitor days. Most PQView databases store steady-state trend data in packed weekly records. In some cases, the record length may be shorter depending on how data was imported. Due to the way PQWeb calculates monitor days, monitor availability will be overestimated if the monitor was out of service for a few days within a weekly record. Typically, this overestimate might be 10%. Options for dealing with this issue include:

- Turn off consideration of steady state records on the Monitor Days Preferences page. This will probably underestimate the availability.
- Some newer PQView databases have monitor event records, described under the next heading. These allow efficient monitor availability calculations with a daily granularity.
- Accept this level of inaccuracy.

3.4.2. Monitor Event Records

Some newer PQView databases have "monitor event" records added for each day that a steady state measurement was taken, whether or not a transient or rms variation was recorded. These records allow the calculation of daily monitor availability without unpacking the steady state records. They are not counted in the totals of "triggered events". If the database appears to have these records, a note will appear at the bottom of the report. You can then turn off consideration of steady state records on the Monitor Days Preferences page, with no loss of accuracy and some performance improvement.

3.5. Trend Channel Preferences

This set of preferences determines which channels are plotted in the Steady State report. You must specify at least one channel (and possibly one phase) to make a Steady State report.

The Channel Preferences page can be accessed by clicking the Channels link in the Trends section of the Reports page, or by clicking the Channels link in the menu at the top of any Steady State Trend report. Clicking one of these links brings up the page shown below:

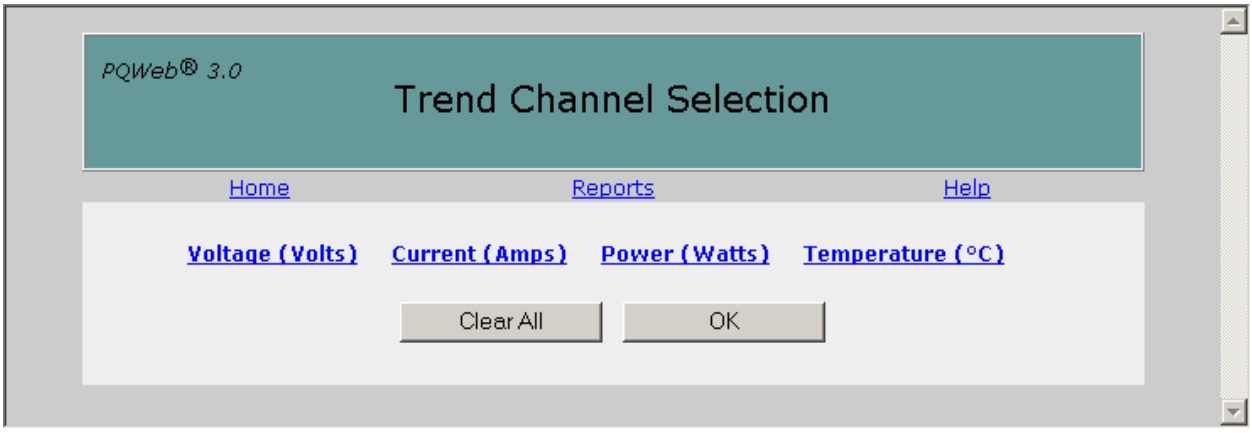


Figure 18 – Trend Channel Category Selection page

This page lists all categories contained in the Channels table of the current PQView database. Some databases contain more channel categories than others. To select individual channels, click on a category name. To clear any previously selected channels before making your selections, click the **Clear All** button.

After you have selected a category, the page shown below appears. (This example uses the Voltage category).

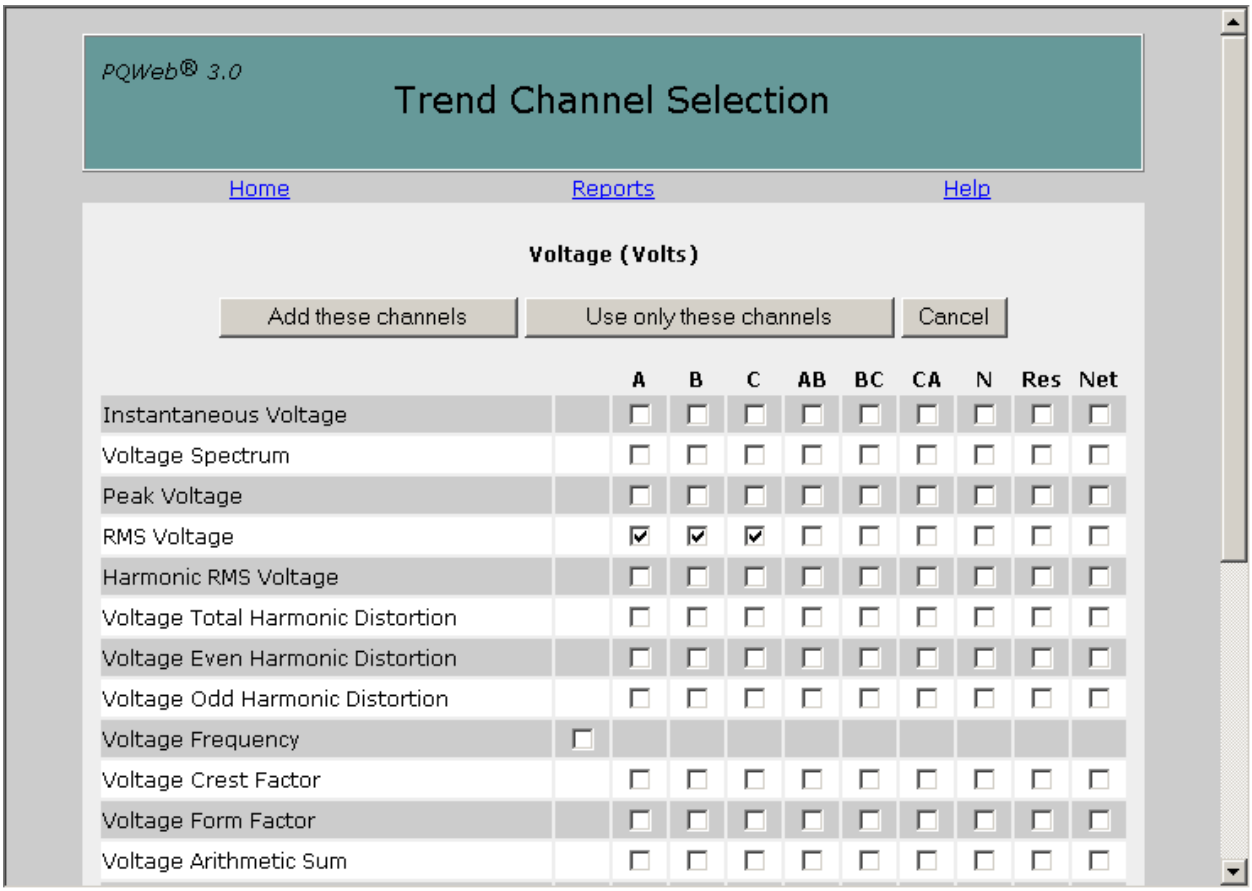


Figure 19 – Trend Channel Selection page

This page lists all available channels in the selected channel category, with a checkbox for each available phase for that channel. If phases do not apply to a particular channel, then a single checkbox will appear to the left of the phase columns, as shown for "Voltage Frequency" in the page shown above.

You can select channels and phases for your Trend reports by clicking on the appropriate check boxes. After you have made your selections, click the **Add These Channels** button to add the channels in this category to channels you have selected in other categories. To use only the selected channels in this category, click the **Use Only These Channels** button. To cancel your selections in this category, click **Cancel**. Clicking any of these three buttons will return you to the Channel Categories page shown in Figure 18.

After you click **OK** on the Channel Categories page, any changes take effect for the next query or graph request. If you accessed this page from a menu link on a Trend Report page, the report will be automatically regenerated with the newly selected channels.

3.6. Trend Display Preferences

This set of preferences determines which types of plot appear in the Steady State Trend report. You must choose at least one trend plot or one histogram plot.

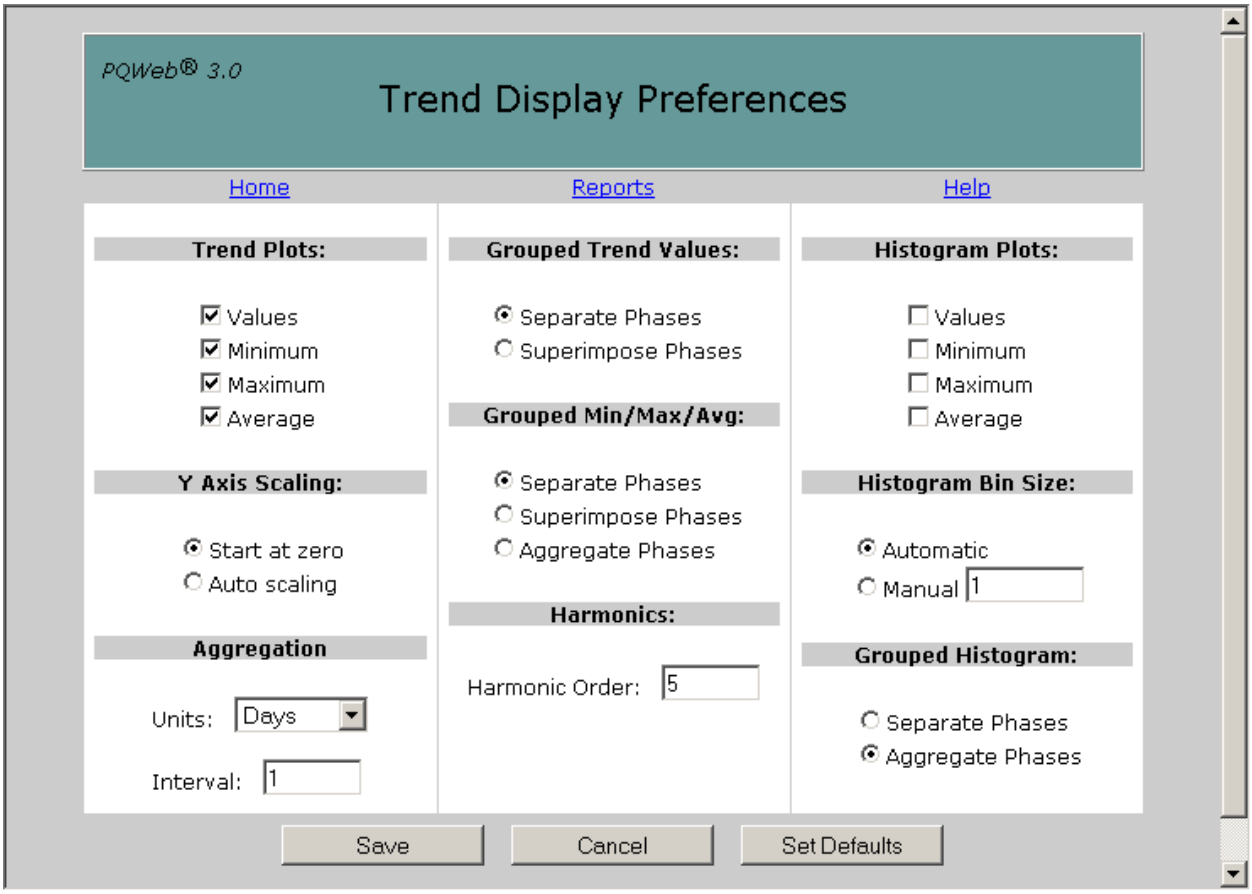


Figure 20 – Trend Display Preferences page

- **Trend Plots** - choose to plot all measured values and/or a set of up to three curves for the minimum, maximum, and average values.
- **Y Axis Scaling** – controls whether trend and RMS plots will be automatically scaled in the Y axis, or whether the Y axis will always start at zero
- **Aggregation** -
- **Grouped Trend Values** - choose whether to plot all phases of a channel on the same or separate graphs.
- **Grouped Trend Min/Max/Avg** - choose whether to plot all phases of a channel on the same or separate graphs, or to use envelope aggregation. With superimposed phases, a trend plot would include nine traces for the minimum, maximum, and average of three

phases. With envelope aggregation, all three phases of a channel will be considered to plot three summary traces for minimum, maximum, and average.

- **Harmonic Order** – choose which harmonic to plot for voltage or current spectrum channels (see section 2.8.1).
- **Histogram Plots** - plot a histogram with superimposed cumulative probability function, for measured values, minimum, maximum, and/or average.
- **Histogram Bin Size** - for histogram plots, the bin size (in volts, amps, or per-unit) can be calculated automatically, or specified manually.
- **Grouped Histogram** - choose whether to tabulate all phases of a channel separately, or aggregated.

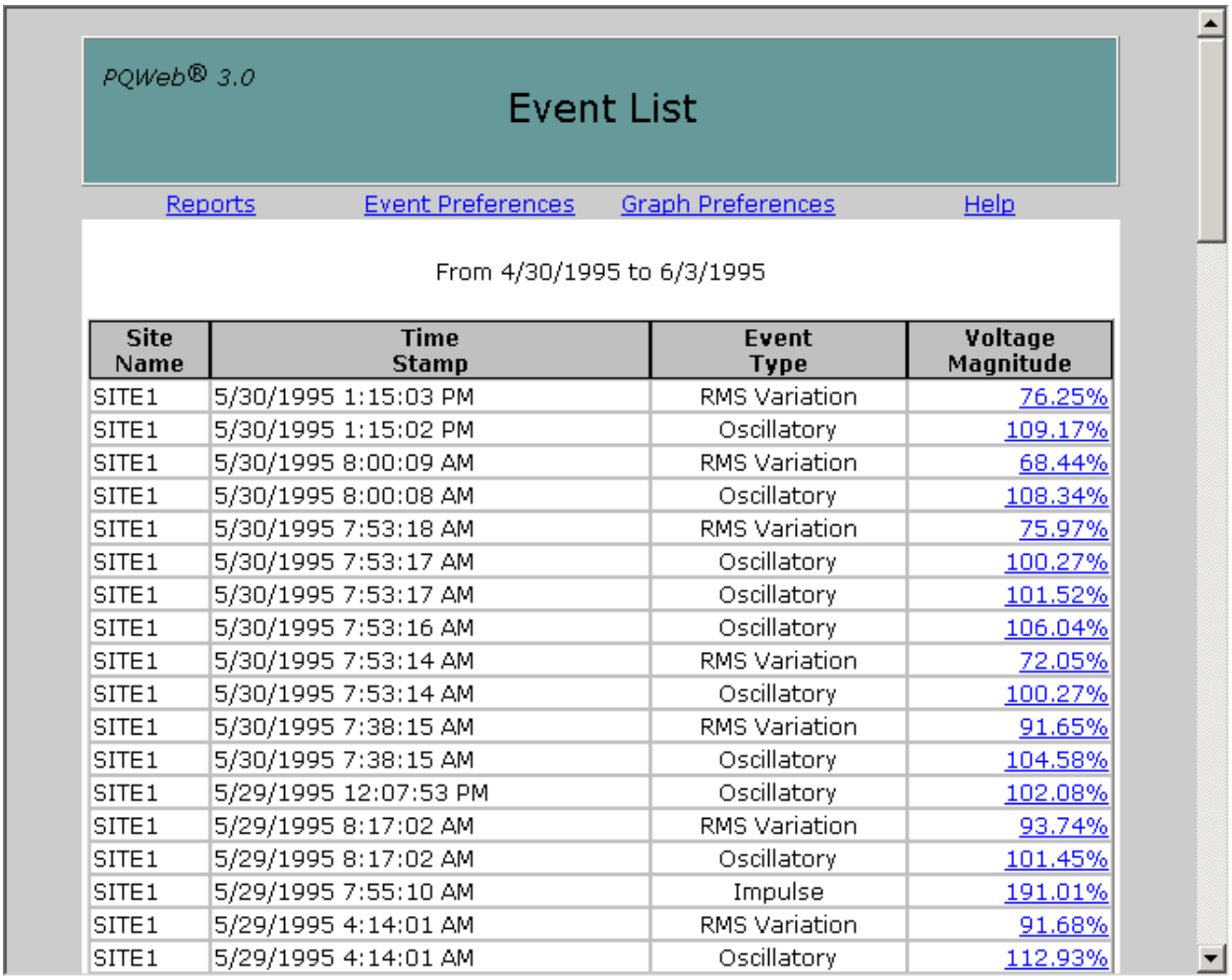
After you click **Save**, any changes take effect for the next query or graph request.

4. Tutorial Examples

This section includes step-by-step instructions for generating three PQWeb reports: an Event List, an RMS Summary, and a Steady-StateTrend Report. These examples assume that access to the sample PQView database SAMPLE21 has been set up by the administrator.

4.1. Event List Example

1. Bring up the PQWeb Home page (Figure 2) by typing in the URL or clicking on a link provided by your Web Administrator, and entering your user ID and password (Figure 1).
2. Select **Sample21** in the listbox of database names (or select any other available database).
3. Click the **Continue** button. This will bring up the Reports page (Figure 3).
4. Select **Site1** in the listbox of sites (or select any listed site if you are using a database other than Sample21).
5. Select **Full Date Range** in the listbox of time range shortcuts.
6. Select **All Events** in the listbox of Event reports.
7. Click the **Report** button in the Events section.
8. After a brief delay for data retrieval, the Shortcut Event List report (Figure 21) will be displayed.



Site Name	Time Stamp	Event Type	Voltage Magnitude
SITE1	5/30/1995 1:15:03 PM	RMS Variation	76.25%
SITE1	5/30/1995 1:15:02 PM	Oscillatory	109.17%
SITE1	5/30/1995 8:00:09 AM	RMS Variation	68.44%
SITE1	5/30/1995 8:00:08 AM	Oscillatory	108.34%
SITE1	5/30/1995 7:53:18 AM	RMS Variation	75.97%
SITE1	5/30/1995 7:53:17 AM	Oscillatory	100.27%
SITE1	5/30/1995 7:53:17 AM	Oscillatory	101.52%
SITE1	5/30/1995 7:53:16 AM	Oscillatory	106.04%
SITE1	5/30/1995 7:53:14 AM	RMS Variation	72.05%
SITE1	5/30/1995 7:53:14 AM	Oscillatory	100.27%
SITE1	5/30/1995 7:38:15 AM	RMS Variation	91.65%
SITE1	5/30/1995 7:38:15 AM	Oscillatory	104.58%
SITE1	5/29/1995 12:07:53 PM	Oscillatory	102.08%
SITE1	5/29/1995 8:17:02 AM	RMS Variation	93.74%
SITE1	5/29/1995 8:17:02 AM	Oscillatory	101.45%
SITE1	5/29/1995 7:55:10 AM	Impulse	191.01%
SITE1	5/29/1995 4:14:01 AM	RMS Variation	91.68%
SITE1	5/29/1995 4:14:01 AM	Oscillatory	112.93%

Figure 21 – Event List Report

9. Click on the **Voltage Magnitude** value for the first event in the list to bring up an Event Report (Figure 22) for that event in a separate window.

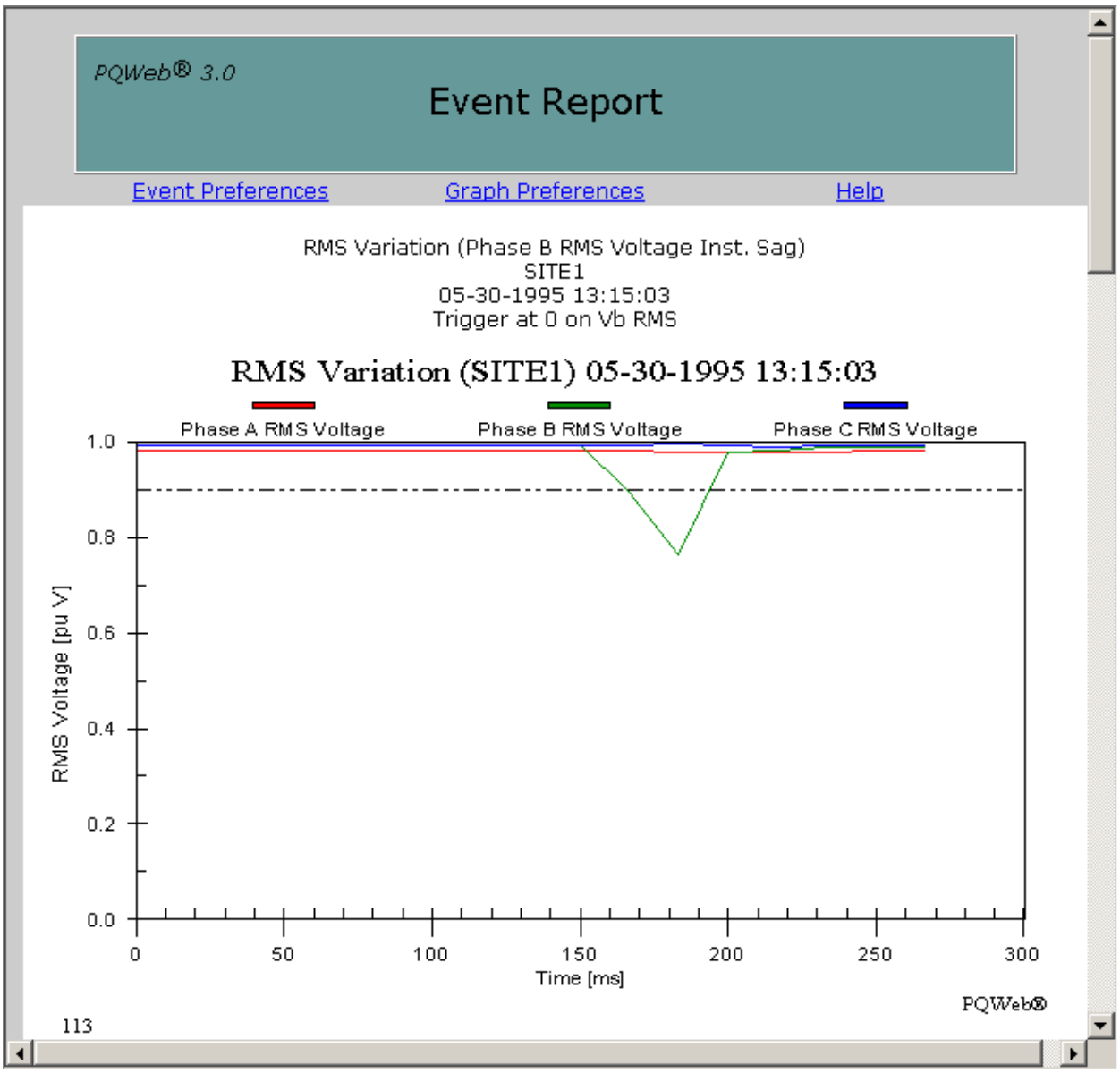


Figure 22 – Event Report

10. To return to the Reports page from the Event List report, click the **Reports** link in the navigation menu below the page header, or use your browser's Back button.

4.2. RMS Summary Example

1. Bring up the PQWeb Home page (Figure 2) by typing in the URL or clicking on a link provided by your Web Administrator, and entering your user ID and password (Figure 1).
2. Select **Sample21** in the listbox of database names (or select any other available database).

3. Click the **Continue** button. This will bring up the Reports page (Figure 3).
4. Select **Site1** in the listbox of sites (or select any listed site if you are using a database other than Sample21).
5. Select **Full Date Range** in the listbox of time range shortcuts.
6. Select **RMS Summary** in the listbox of RMS Variation reports.
7. Click the **Report** button in the RMS Variations section.
8. After a brief delay for data retrieval, the RMS Summary report (Figure 23) will be displayed.

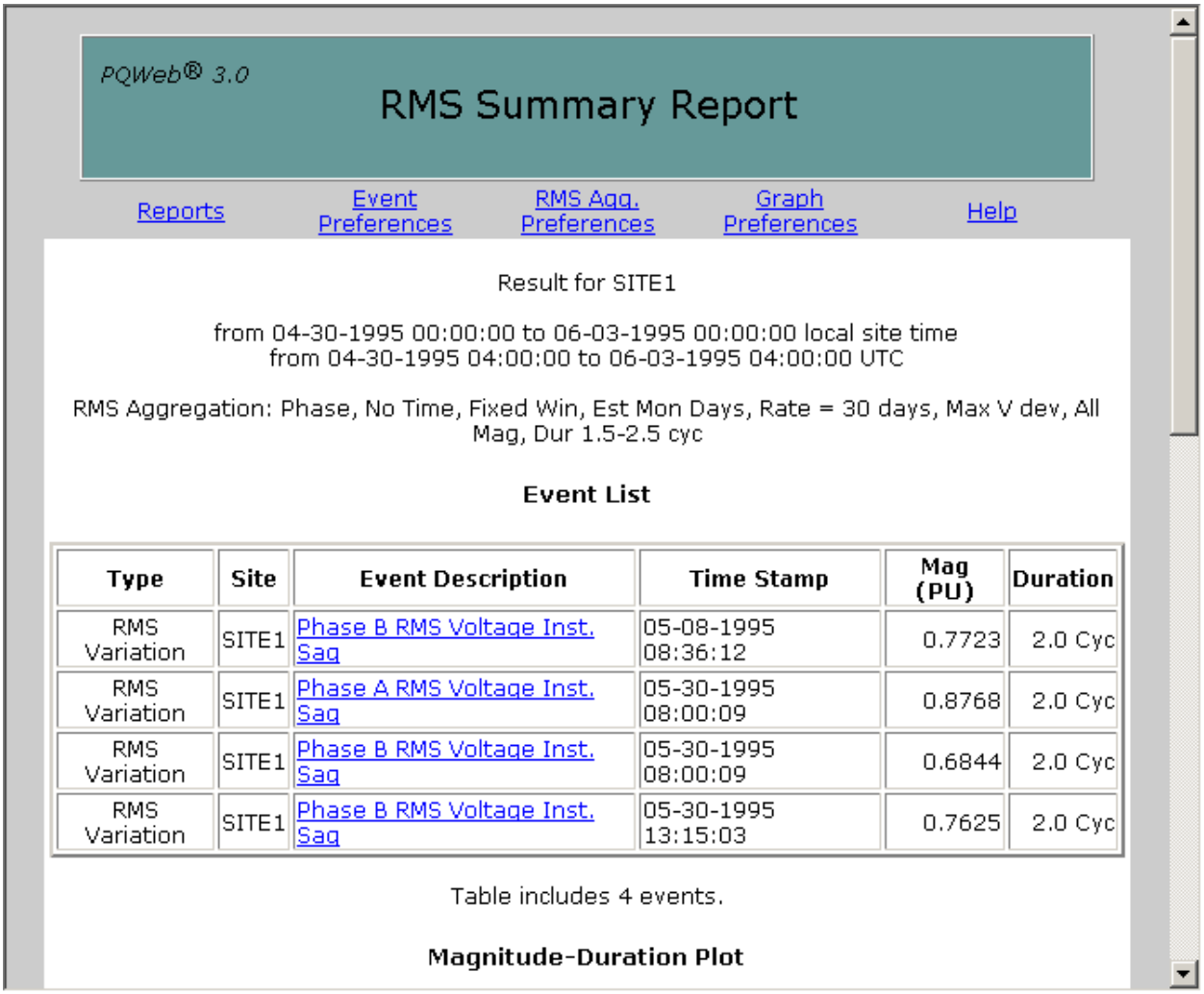

PQWeb® 3.0
RMS Summary Report
Reports
Event Preferences
RMS Agg. Preferences
Graph Preferences
Help
Result for SITE1
from 04-30-1995 00:00:00 to 06-03-1995 00:00:00 local site time
from 04-30-1995 04:00:00 to 06-03-1995 04:00:00 UTC
RMS Aggregation: Phase, No Time, Fixed Win, Est Mon Days, Rate = 30 days, Max V dev, All Mag, Dur 1.5-2.5 cyc
Event List
Type | Site | Event Description | Time Stamp | Mag (PU) | Duration
RMS Variation | SITE1 | Phase B RMS Voltage Inst. Sag | 05-08-1995 08:36:12 | 0.7723 | 2.0 Cyc
RMS Variation | SITE1 | Phase A RMS Voltage Inst. Sag | 05-30-1995 08:00:09 | 0.8768 | 2.0 Cyc
RMS Variation | SITE1 | Phase B RMS Voltage Inst. Sag | 05-30-1995 08:00:09 | 0.6844 | 2.0 Cyc
RMS Variation | SITE1 | Phase B RMS Voltage Inst. Sag | 05-30-1995 13:15:03 | 0.7625 | 2.0 Cyc
Table includes 4 events.
Magnitude-Duration Plot

Figure 23 – RMS Summary Report

9. To return to the Reports page from the RMS Summary report, click the **Reports** link in the navigation menu below the page header, or use your browser's Back button.

4.3. Steady-State Trend Example

1. Bring up the PQWeb Home page (Figure 2) by typing in the URL or clicking on a link provided by your Web Administrator, and entering your user ID and password (Figure 1).
2. Select **Sample21** in the listbox of database names (or select any other available database).
3. Click the **Continue** button. This will bring up the Reports page (Figure 3).
4. Select **Site1** in the listbox of sites (or select any listed site if you are using a database other than Sample21).
5. Select **Full Date Range** in the listbox of time range shortcuts.
6. Click on the **Channels** link in the Trends section of the Reports page.
7. Click the **Clear All** button on the Channel Category Selection page (Figure 18).
8. Click on the **Voltage** link on the Channel Category Selection page. This will bring up the Channel Selection page (Figure 19).
9. Select the checkboxes for RMS Voltage phases A, B, and C.
10. Click the **Use Only These Channels** button on the Channel Selection page.
11. Click the **OK** button on the Channel Category Selection page.
12. Select **Steady State** from the listbox in the Trends section of the Reports page.
13. Click the **Report** button in the Trends section.
14. After a brief delay for data retrieval, the Steady State Trend report (Figure 24) will be displayed.

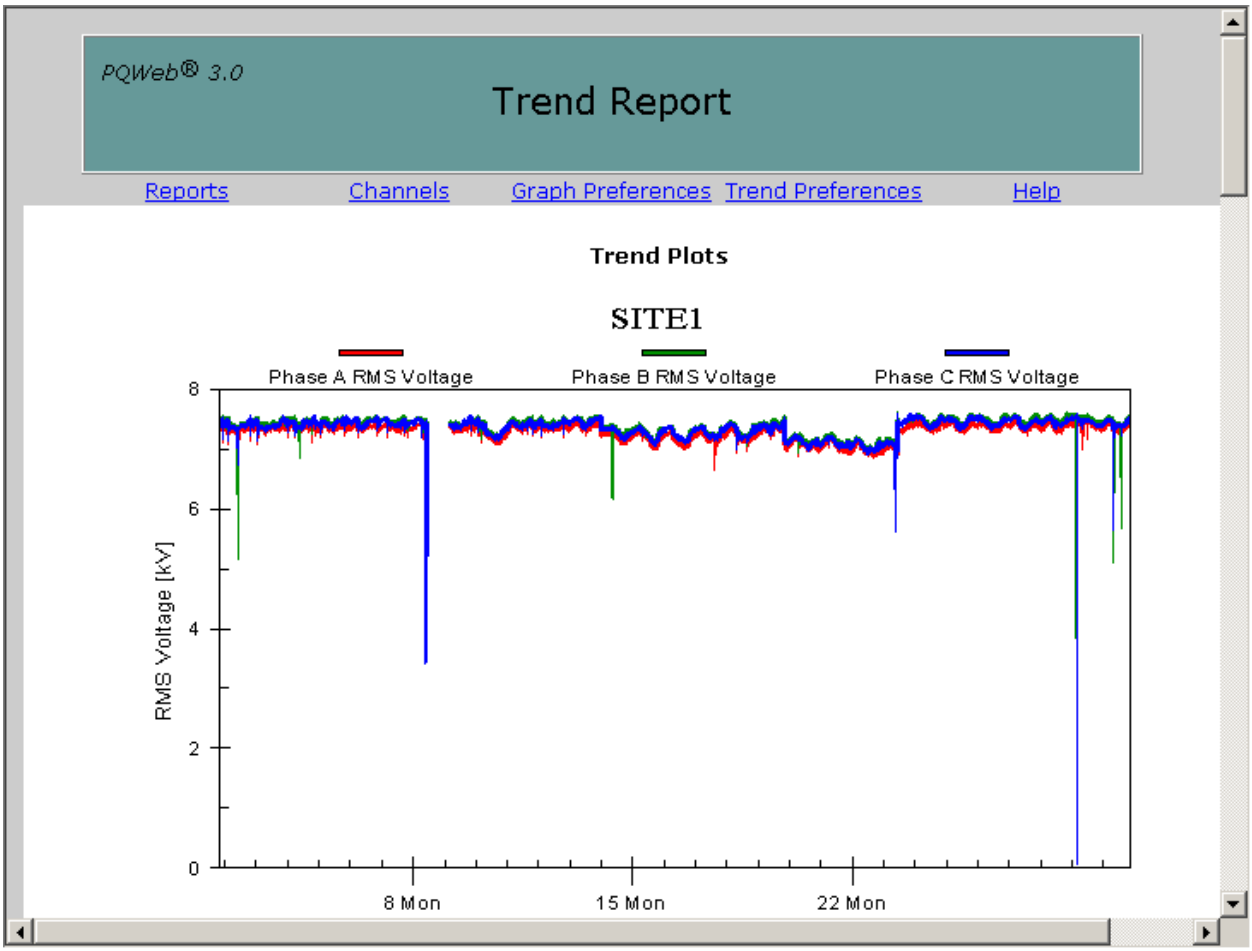


Figure 24 – Trend Report

15. To return to the Reports page from the Steady State Trend report, click the **Reports** link in the navigation menu below the page header, or use your browser's Back button.